Level Three OC Production
LEVEL 2 OC (OIL BASED)
4.0% CAPSAICINOIDS 1,000,000 SHU
5.0%
The very oily Level 2 OC must be diluted with an industrial solvent to ensure even dispersion of the Capsaicin. 19:1
4.0% CAPSAICINOIDS
X 5%
0.2% CAPSAICINOIDS
1,000,000 SHU
X 5%
50,000 SHU
LEVEL 2 OC (WATER BASED)
2.0% CAPSAICINOIDS 500,000 SHU
10.0%
The water soluble OC may now be mixed with water. Small quantities of solvent & emulsifiers are used to ensure even dispersion of the Capsaicin. 9:1
2.0% CAPSAICINOIDS
X 10%
0.2% CAPSAICINOIDS
500,000 SHU
X 10%
50,000 SHU

Level 2
Level 3
Level 2
ARMOR HOLDINGS, INC.

ARMOR HOLDINGS, INC.

OC versus CN / CS

- CN and CS are extremely effective when delivered as a pyrotechnic.
- In solution they are not as consistent in effecting those under the influence.
- May have a greater failure rate.

Blended Sprays
Blends provide the combined physiological effect of each ingredient. Blends produce a reaction that appears more powerful than any single formula.
ARMOR HOLDINGS, INC

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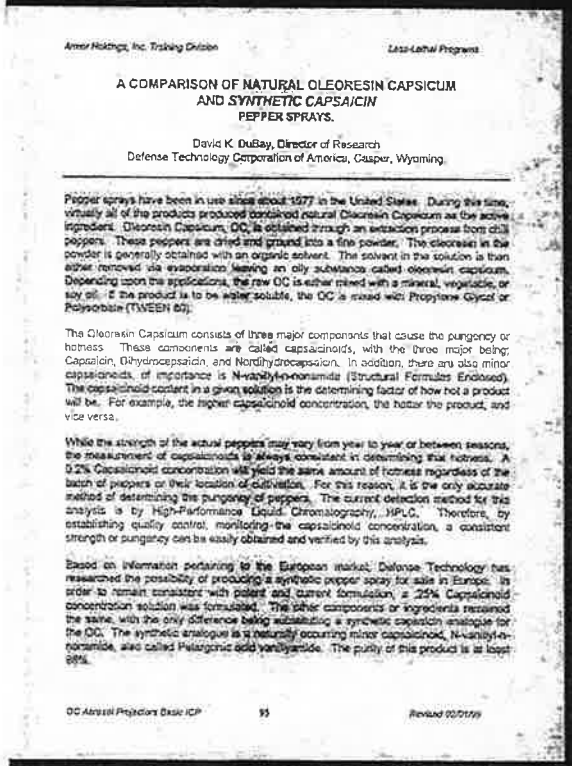
SYNTHETIC OC



Armor Holdings, Inc. Training Division — Less-Lethal Programs

A COMPARISON OF NATURAL OLEORESIN CAPSICUM AND *SYNTHETIC CAPSAICIN* PEPPER SPRAYS.

David K. DuBay, Director of Research
Defense Technology Corporation of America, Casper, Wyoming

Pepper sprays have been in use since about 1977 in the United States. During this time, virtually all of the products produced contained natural Oleoresin Capsicum as the active ingredient. Oleoresin Capsicum, OC, is obtained through an extraction process from chili peppers. These peppers are dried and ground into a fine powder. The oleoresin in the powder is generally obtained with an organic solvent. The solvent in the solution is then either removed via evaporation leaving an oily substance called oleoresin capsicum. Depending upon the applications, the raw OC is either mixed with a mineral, vegetable, or soy oil. If the product is to be water soluble, the OC is mixed with Propylene Glycol or Polysorbate (TWEEN 60).

The Oleoresin Capsicum consists of three major components that cause the pungency or hotness. These components are called capsaicinoids, with the three major being; Capsaicin, Dihydrocapsaicin, and Nordihydrocapsaicin. In addition, there are also minor capsaicinoids, of importance is N-vanillyl-n-nonamide (Structural Formulas Enclosed). The capsaicinoid content in a given solution is the determining factor of how hot a product will be. For example, the higher capsaicinoid concentration, the hotter the product, and vice versa.

While the strength of the actual peppers may vary from year to year or between seasons, the measurement of capsaicinoids is always consistent in determining that hotness. A 0.2% Capsaicinoid concentration will yield the same amount of hotness regardless of the batch of peppers or their location of cultivation. For this reason, it is the only accurate method of determining the pungency of peppers. The current detection method for this analysis is by High-Performance Liquid Chromatography, HPLC. Therefore, by establishing quality control, monitoring the capsaicinoid concentration, a consistent strength or pungency can be easily obtained and verified by this analysis.

Based on information pertaining to the European market, Defense Technology has researched the possibility of producing a synthetic pepper spray for sale in Europe. In order to remain consistent with patent and current formulation, a .25% Capsaicinoid concentration solution was formulated. The other components or ingredients remained the same, with the only difference being substituting a synthetic capsaicin analogue for the OC. The synthetic analogue is a naturally occurring minor capsaicinoid, N-vanillyl-n-nonamide, also called Pelargonic acid vanillyamide. The purity of this product is at least 98%.

OC Aerosol Projectors Basic ICP — 95 — Revised 02/01/99

ADVANTAGES

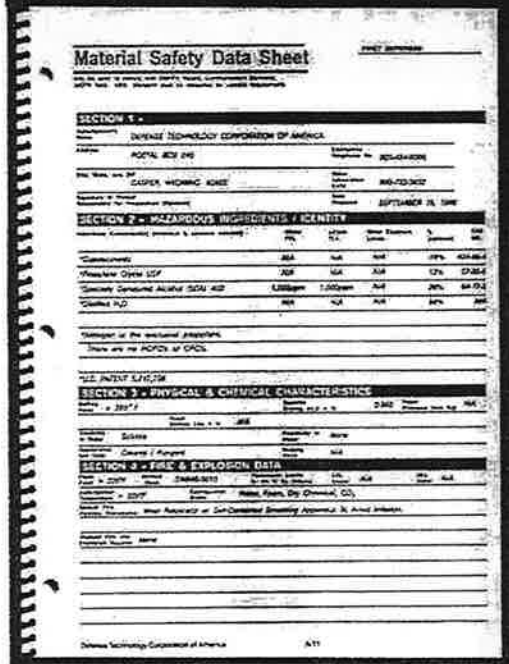
- Consistent in its pungency.

DISADVANTAGES

- Requires additional costly testing to ensure consistency.
- Is no more consistent than natural OC that has been tested for consistency.
- More costly overall.
- Stigma of laboratory produced versus “natural”.

EVALUATING INGREDIENTS
IDENTIFYING
VERIFYING
DOCUMENTATION
TESTING
ARMOR HOLDINGS, INC.

ARMOR HOLDINGS, INC.


Material Safety Data Sheet

- *Solvents* and emulsifiers are essential in producing OC formulations.
- Many formulations (particularly OIL Base) contain as much as 95% solvents.
- Some *Solvents* may have the potential to cause corneal burns and eye damage.

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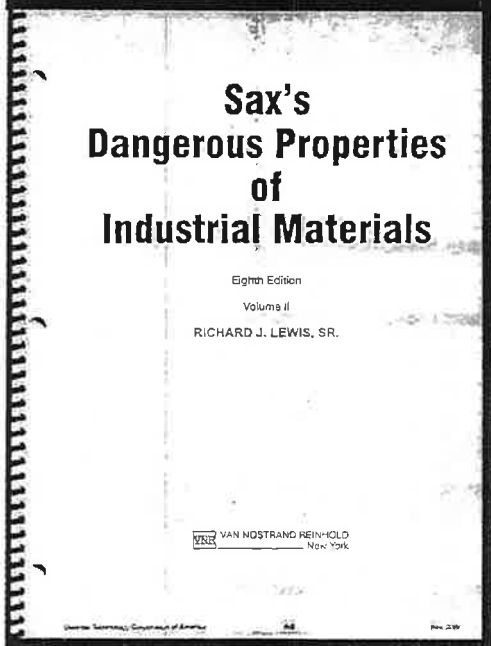


Excerpts from "SAX's Properties of Industrial Materials" eighth edition, volume II, by Richard J. Lewis, Sr.

DRAPER-CHT-0457

CONTENTS	CAPSAICINOID CONTENT	FLAMMABLE PRODUCT	TOXIC* CHEMICAL	CARCINOGEN CHEMICAL	IRRITANT CHEMICAL
A	0.15%	YES	INHALATION	YES	EYES AND SKIN
B	*	YES	INHALATION	-	EYES AND SKIN
C	*	NO	INHALATION	YES	EYES AND SKIN
D	*	YES	INHALATION	-	EYES AND SKIN
E	0.15%	NO	INHALATION	YES	EYES AND SKIN
F	0.15%	NO	INHALATION	-	-
G	0.15%	NO	INHALATION	YES	EYES AND SKIN
H	0.15%	NO	INHALATION	-	EYES AND SKIN
I	0.15%	YES	INHALATION	-	EYES AND SKIN
J	0.15%	NO	INHALATION	-	EYES AND SKIN

* Not to include when present in allowable amounts.

ARMOR HOLDINGS, INC

CAPSAICIN
0.18%

PROPYLENE GLYCOL
13%

ETHANOL
28%

WATER
58%

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29CFR 1910. 1200. Standard must be consulted for specific requirements.

FIRST DEFENSE®

QUICK IDENTIFIER

Common Name: (used on label and list)
5039, 5049, 5069, 5089, 5099, 5721, 5746, 5846L

SECTION 1 -

Manufacturer's Name: *Defense Technology Corporation of America*

Address: *Postal Box 240*

Emergency Telephone No.: *(800) 424-9300*

City, State, and ZIP: *Casper, Wyoming 82602*

Other Information Calls: *(800) 733-3832*

Signature of Person Responsible for Preparation (Optional)

Date Prepared: *2/15/99*

SECTION 2 - HAZARDOUS INGREDIENTS / IDENTITY

Hazardous Component(s) (chemical & common name(s))	OSHA PEL	ACGIH TLV	Other Exposure Limits	% (optional)	CAS NO.
*Capsaicinoids	N/A	N/A	N/A	.18%	404-86-4
*Propylene Glycol USP	N/A	N/A	N/A	13%	57-55-6
*Specialty Denatured Alcohol (SDA) 40B	1,000 ppm	1,000 ppm	N/A	28%	64-17-5
*Distilled H2O	N/A	N/A	N.A	58%	N/A

*Nitrogen is the exclusive propellent.

There are no HCFCs or CFCs

*U.S. Patent 5,217,708

ARMOR HOLDINGS, INC.

Hauser Chemical Labs

Independent Testing

HAUSER

Project: C70513
Date: July 25, 1996
Page 1 of 1
PO # 7293

CLIENT: Defense Technology Corp. of America
2136 Oil Drive
Casper, WY 82604-1511 Attn: Dave DuBay

SAMPLES: One (1) sample was received 7/23/96 labeled as:

1. Pepper Spray lot # OC560

ANALYSIS: Analysis was conducted for the percent of capsaicinoids present in the samples using an Aldrich standard purchased by HCR. Analysis was accomplished by High Pressure Liquid Chromatography (HPLC). Lot standard #3127E was also run for number verification. Ethanol and propylene glycol concentrations were determined by Gas Chromatography. Karl Fischer Coulometry determined water content.

RESULTS: The samples were found to contain the following:

Sample #	% Capsaicinoids (w/w)	% Ethanol (w/w)	% Propylene Glycol (w/w)	% Water (w/w)
OC560	0.18	30	12	58
Std. Lot # 3127E	2.0			

REPORT PREPARED BY:

James Vardas
Associate Chemist

ANALYSIS PERFORMED BY:

James Vardas
Associate Chemist

REPORT REVIEWED BY:

Dan Timmons
Staff Chemist

ARMOR HOLDINGS, INC.

Food Grade Ingredients

Evaluating Ingredients

KALSEC®

Pure Food Guarantee

To: DEFENSE TECHNOLOGY

Address: 1855 SOUTH LOOP CASPER, WY 82601

Subject to the conditions herein provided and in consideration of the purchases by the above customer, all shipments made by KALSEC®, Inc. to, or on the order of, the above customer, are hereby guaranteed, as of the date of such shipment or delivery, to be on such date, not adulterated or misbranded within the meaning of the Federal Food, Drug and Cosmetic Act and not an article which may not, under the provisions of section 404 or 505 of the act, be introduced into commerce.

This guarantee is subject to the following conditions:

It is subject to revocation on ten (10) days notice in writing to the above customer.

Customer shall give prompt notice to the undersigned of any claim by said customer or any third party arising out of any alleged breach of this guarantee and said undersigned, in the event of a claim by any third party, for damages alleged to be caused by a breach of said guarantee, shall have the option to assume the defense of the same by its counsel.

Date: January 6, 1995

KALSEC® Inc.

Gary Hahnfeld
Vice President

DRAPER-CHT-0461

ARMOR HOLDINGS, INC.

Food Grade Ingredients

Specially Denatured Alcohol (Ethanol)

McCormick DISTILLING CO., INC.

INDUSTRIAL ALCOHOL DIVISION

ONE McCORMICK LANE, WESTON, MISSOURI 64098 / TELEPHONE [illegible] / FAX [illegible]

January 9, 1995

Attn: Dave DuBay
Defense Technology
Casper, WY 82602

Attn: Defense Technology Consumer

This letter is to state that the SDA-40-B, 190 proof alcohol, purchased from us by Defense Technology is manufactured by Midwest Grain Products Co. of Atchison, KS. The 190 proof alcohol used before denaturing is certified to be USP alcohol.

The denaturant, bitrex, is added to the alcohol as a detourant and is not harmful.

Regards,

Kim Franklin

Kim Franklin
Industrial Alcohol Supervisor

DRAPER-CHT-0462

ARMOR HOLDINGS, INC.

Food Grade Ingredients

Propylene Glycol

Van Waters & Rogers Inc.
subsidiary of Univar

BOX 9007
CASPER, WY 82601
PHONE (307) 237-4554

January 06, 1995

Defense Technology Corp of America
1749 South Loop
Casper, Wy. 82602

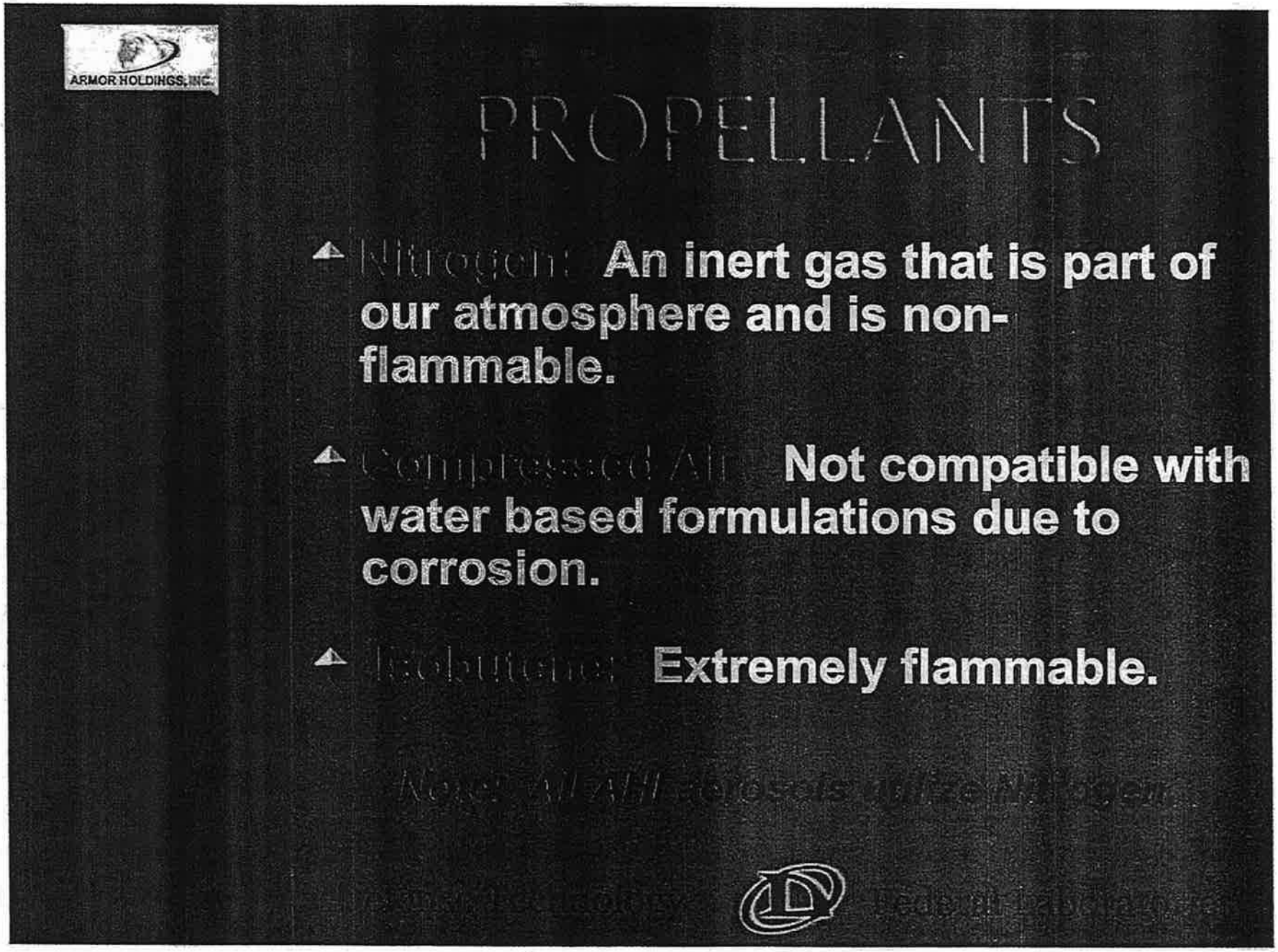
To: Customers of Defense Technology,

Van Waters & Rogers Inc. has become the largest chemical distributor in North America. We are the industry leader in high purity packaging for the food, pharmaceutical and electronics industry.

Van Waters & Rogers Inc. is a distributor of " Propylene Glycol USP/FCC " material. We have been supplying Defense Technology with this food grade material for over two years from our Casper Branch.

Sincerely,

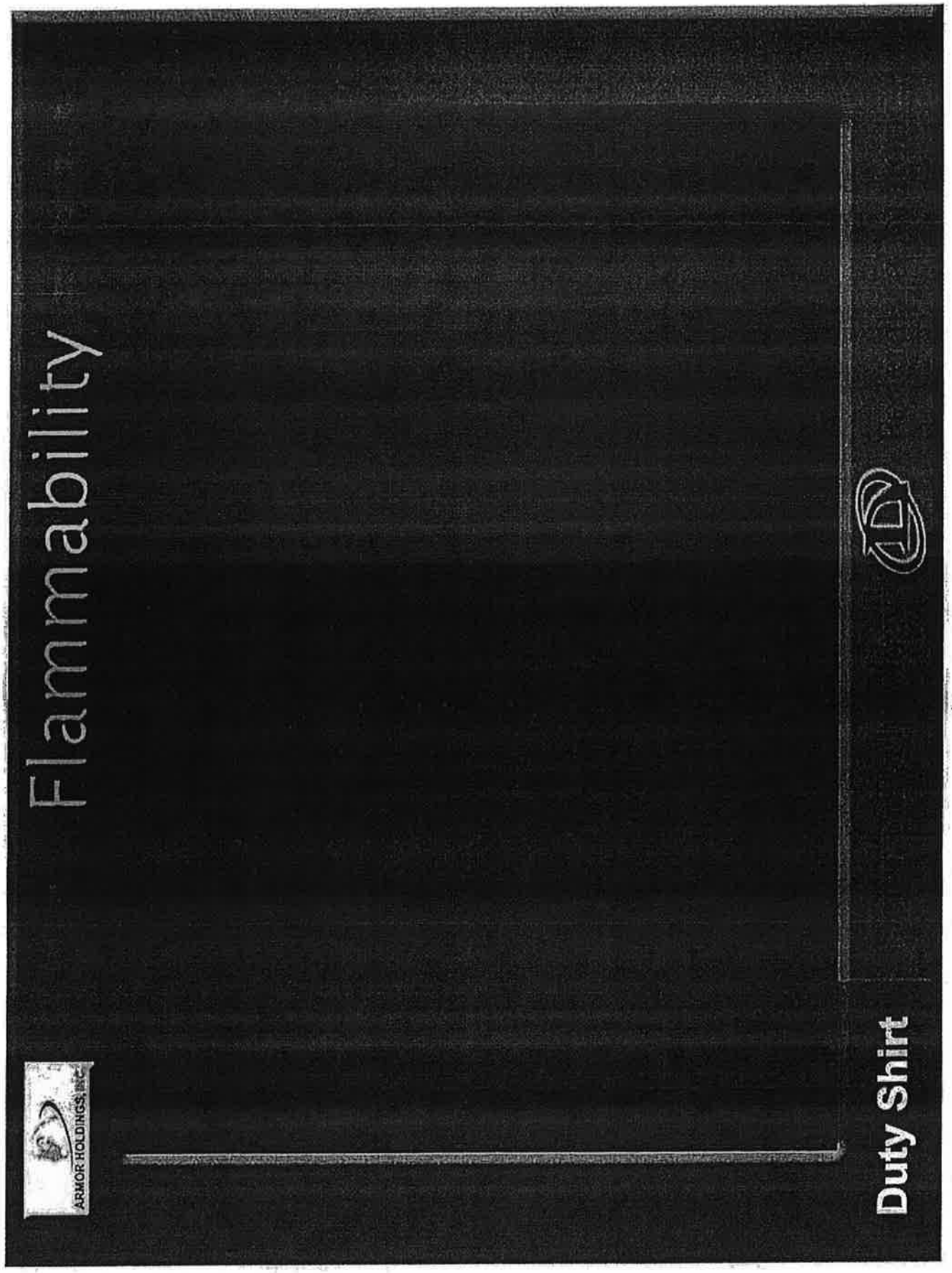
Larry Ribordy
Branch Supervisor



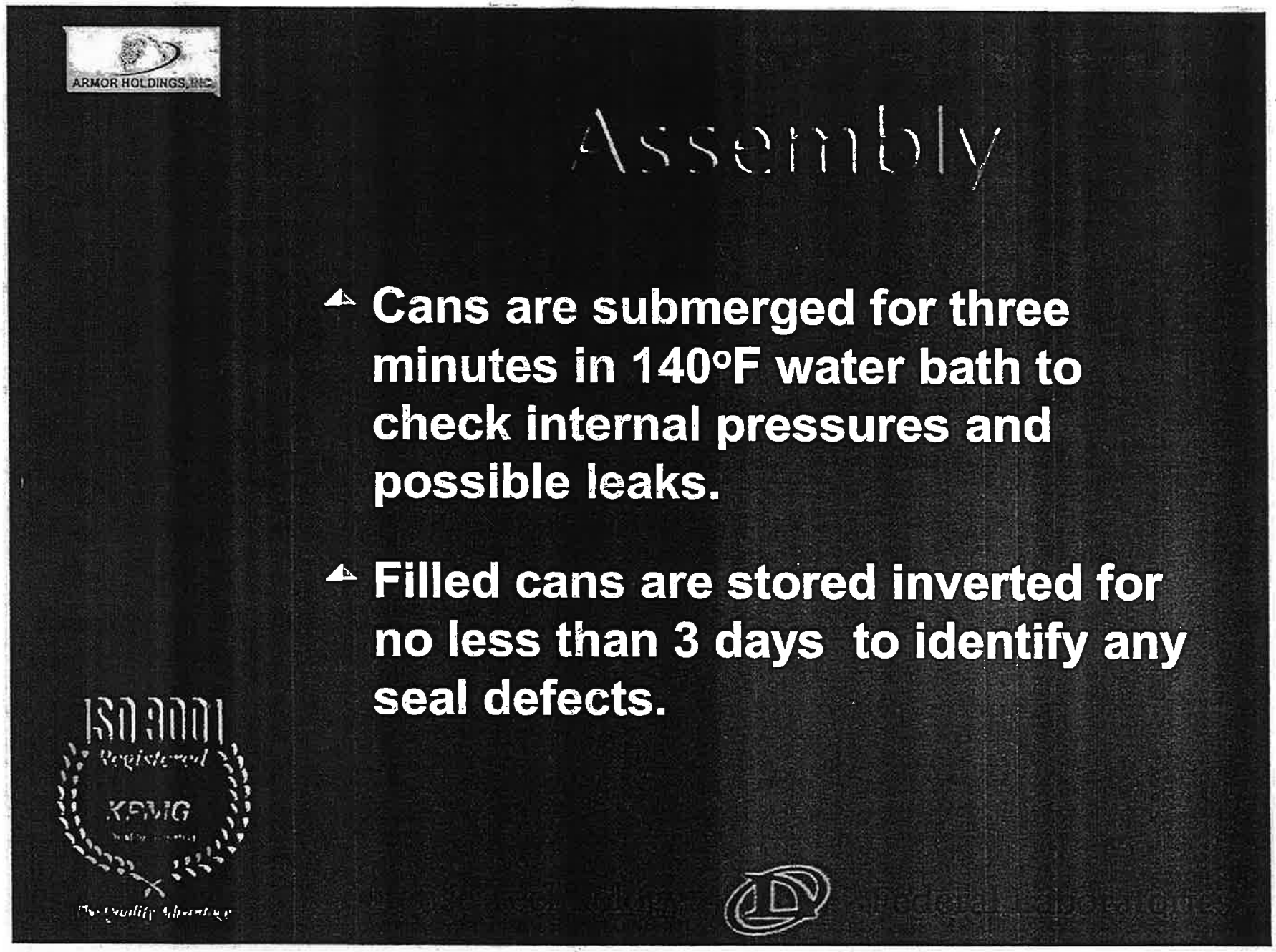
FLAMMABILITY
ARMOR HOLDINGS, INC.
FLAMMABLE LIQUID
3

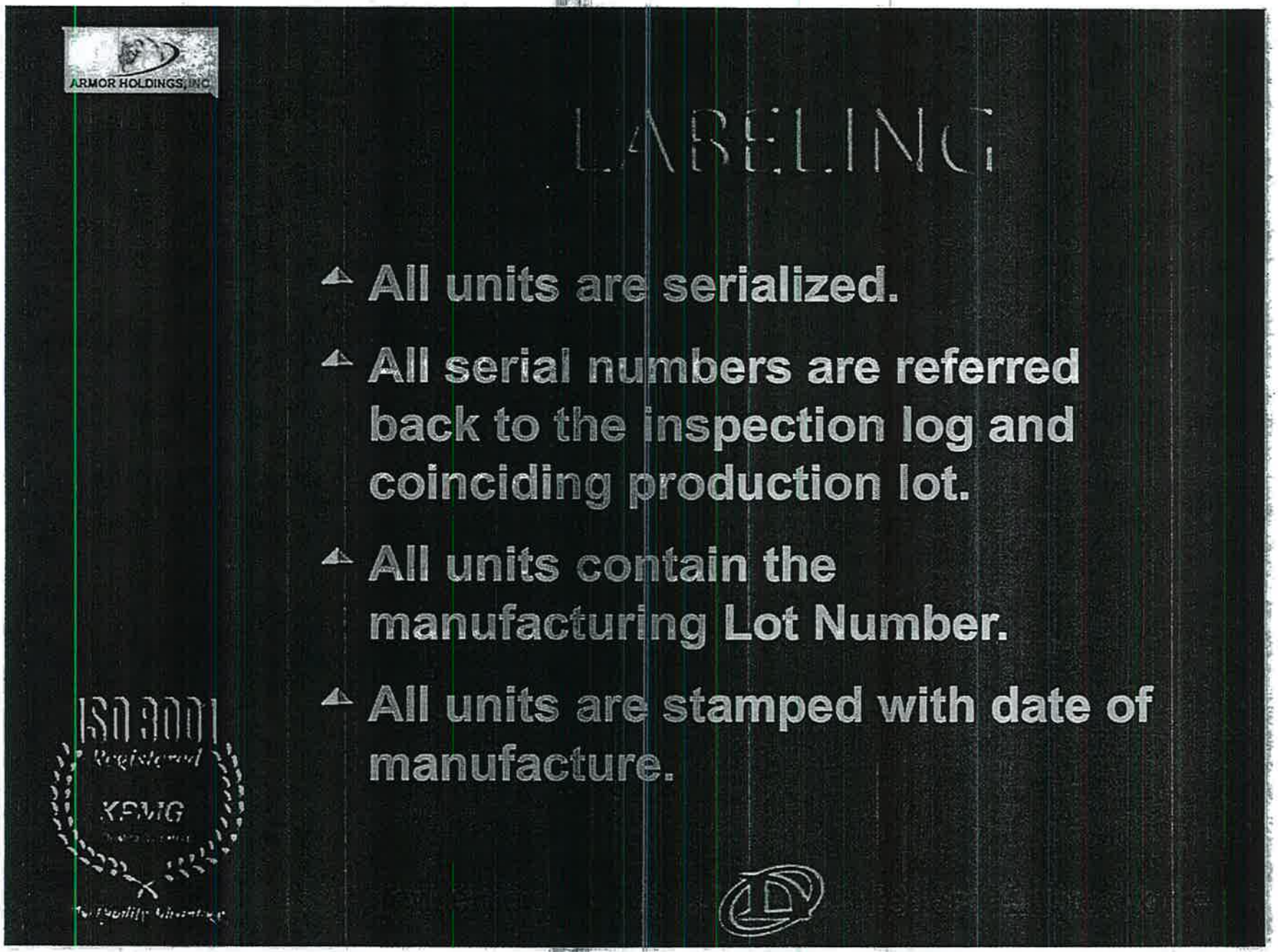
Flammability
ARMOR HOLDINGS, INC.
Open Flame

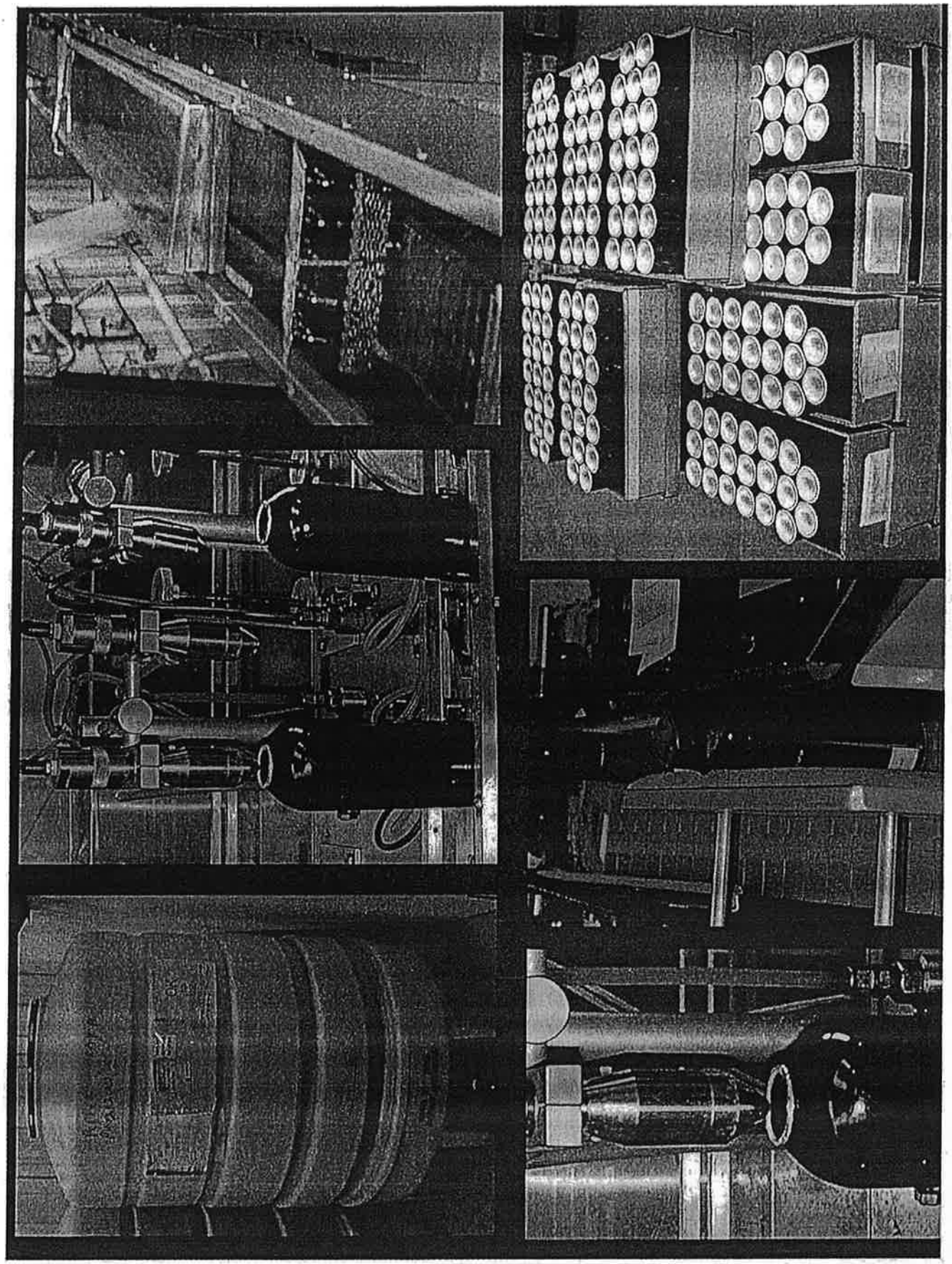
Flammability
ARMOR HOLDINGS
Duty Shirt


Flammability
ARMOR HOLDINGS, INC.
Duty Shirt

Assembly
Tested formulation is selected and brought to the fill line.
Machinery is confirmed clean and adjusted.
Parts are visually inspected.
Cans are filled, valves are seated and sealed, then crimped and pressurized.
ARMOR HOLDINGS, INC.







OVERVIEW
ARMOR HOLDINGS

ARMOR HOLDINGS, INC.

CLASSIFICATION

- OC is classified as an a substance which causes localized heat, redness, swelling, and pain to all contaminated skin and tissues.
- The Department of Transportation classifies OC as an irritant, but OC ***is not*** classified as a chemical irritant.

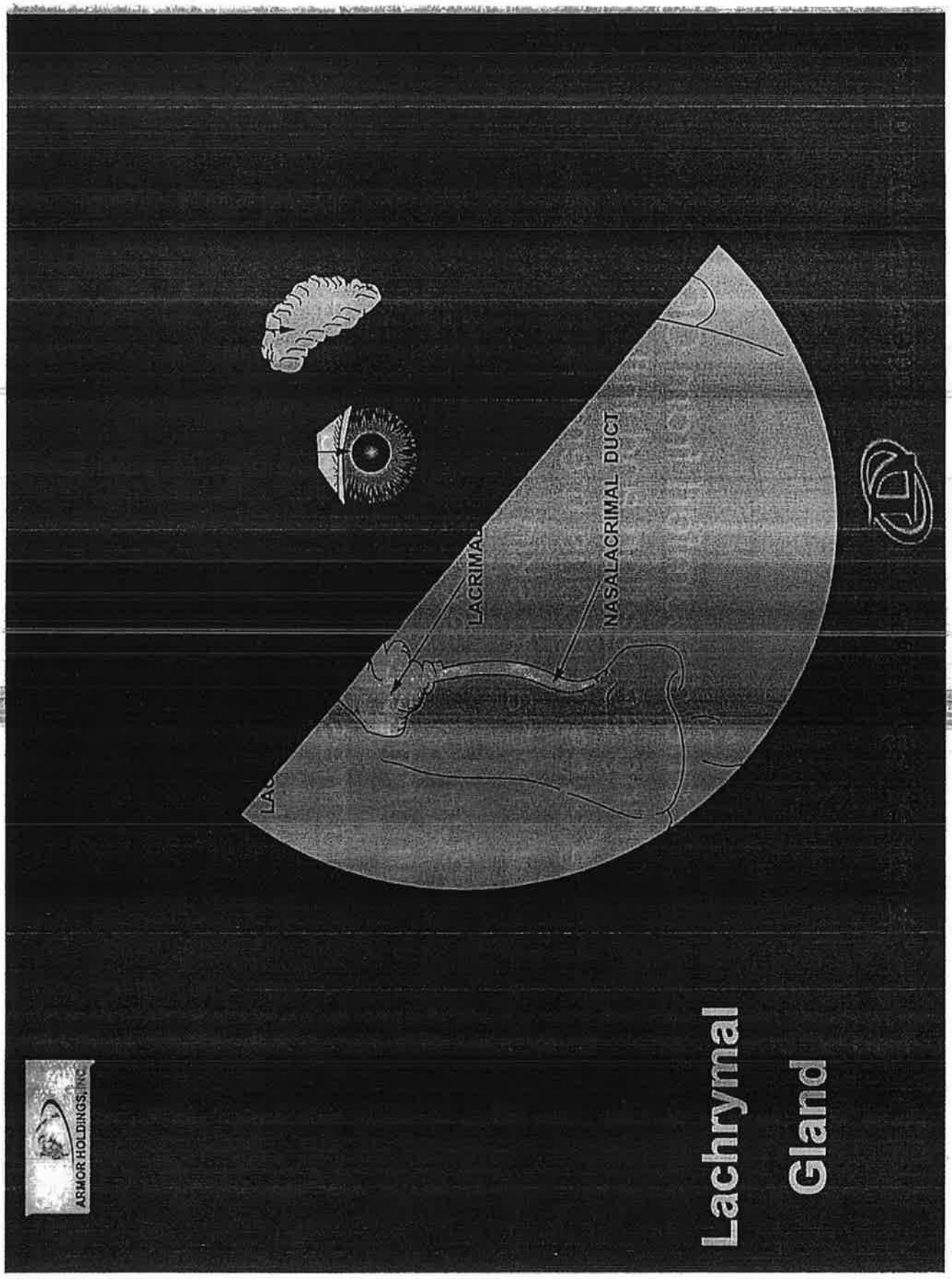
Physiological Effects

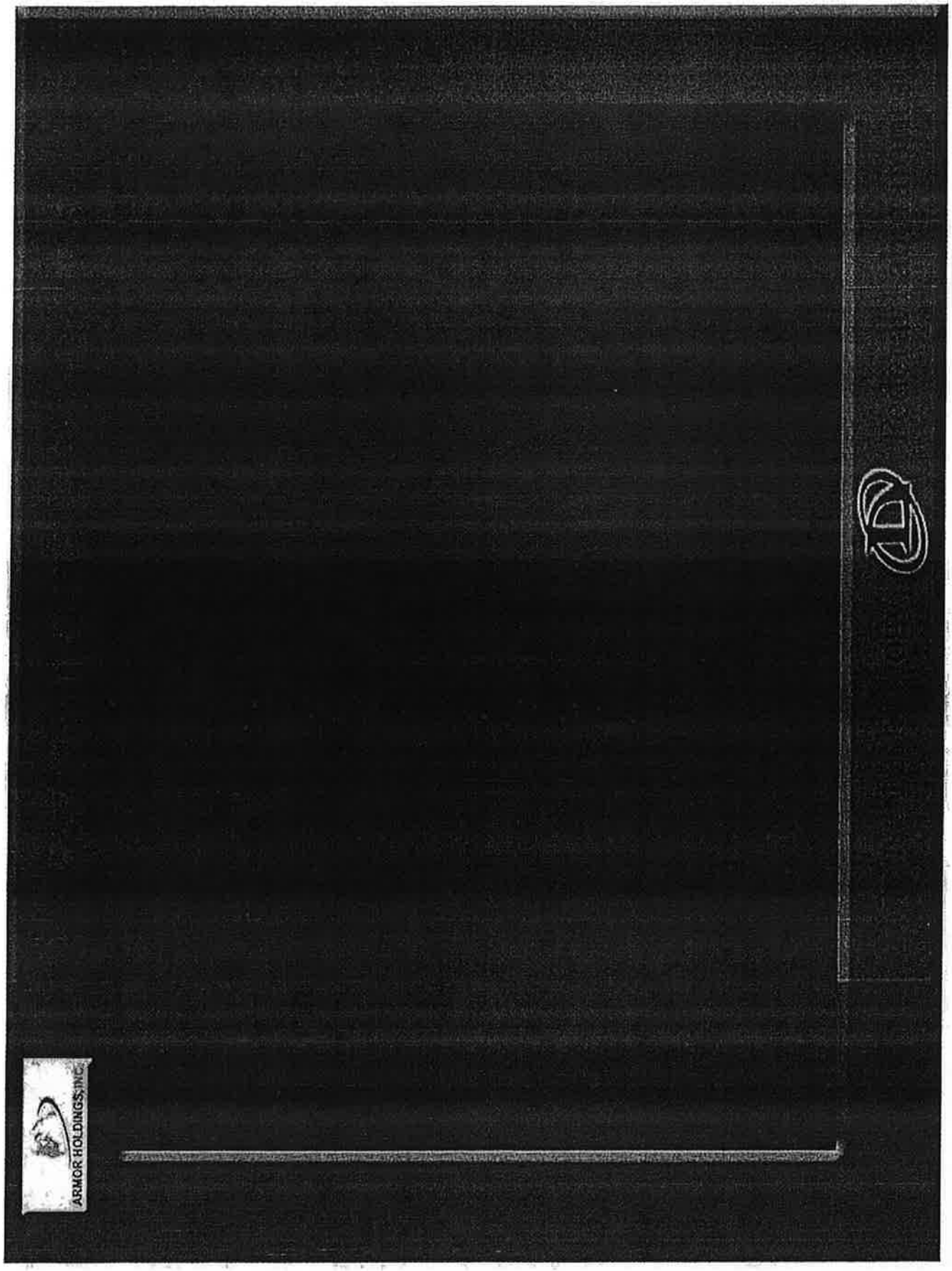
- Involuntary closure of the eyes resulting in temporary visual impairment.
- Involuntary closure of the eyes is one of the primary benefits, this occurs when capsaicin contacts the nerve endings in the eye.
- Capsaicin is a vasodilator.

ARMOR HOLDINGS, INC.

Physiological Effects

- Pain and discomfort from OC causes a burning sensation and inflammation of the eyes, mucous membranes, and contaminated skin.
- Secretion of excessive mucous, rhinorrhea.
- Shortness of breath, dyspnea.
- Tightness of the chest associated with a gripping pain.

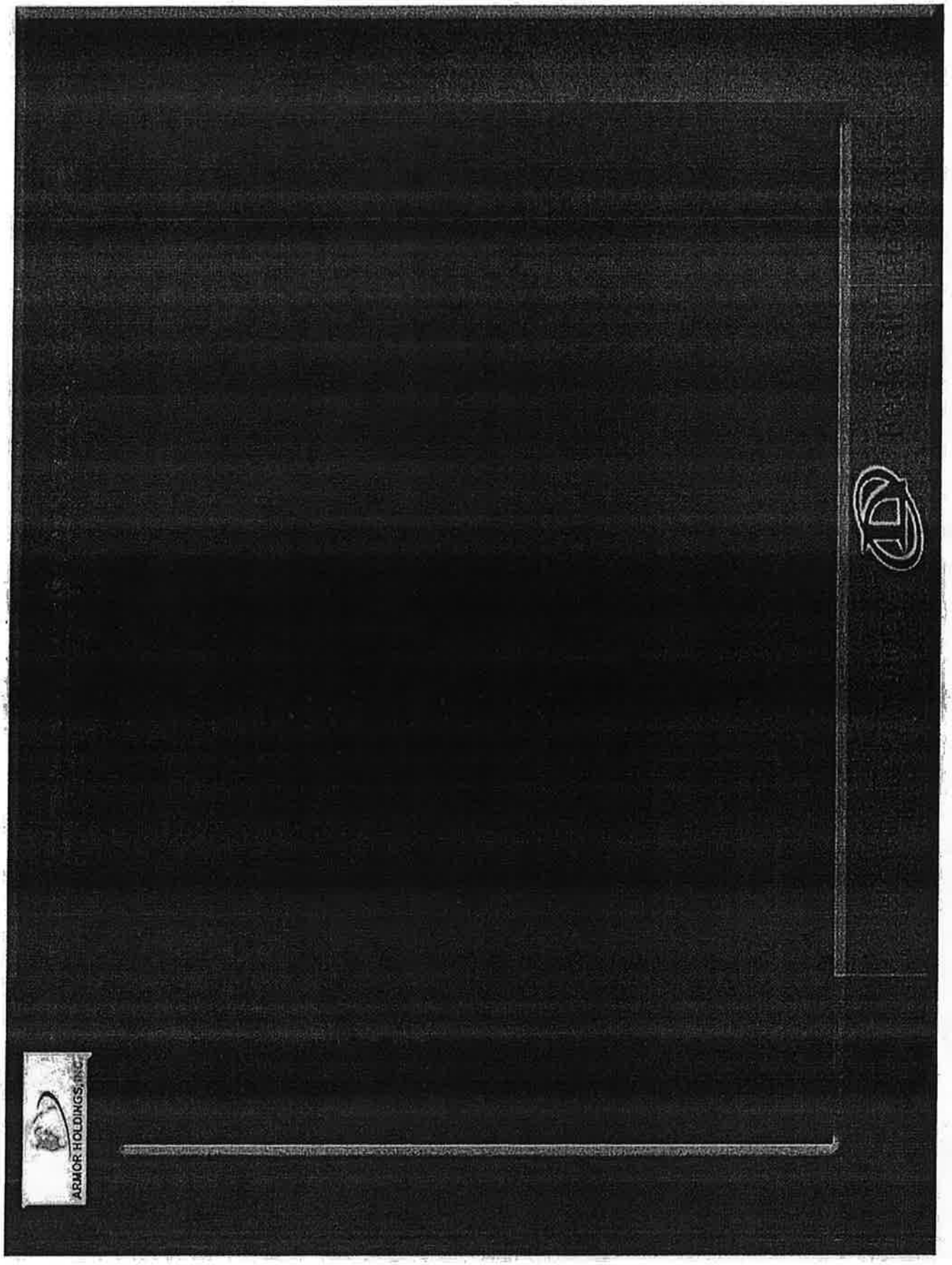

Lachrymal
Gland
NASALACRIMAL DUCT
ARMOR HOLDINGS, INC


ARMOR HOLDINGS, INC.

ARMOR HOLDINGS, INC
▲ OC has a varied reaction time ranging from 1 to 5 seconds.
▲
▲
▲ Failure rate of OC is difficult to quantify, however it does exist.
▲

Delivery Systems
Foggers
Ballistic Systems
Defense Technologies
ARMOR HOLDINGS, INC.

ARMOR HOLDINGS, INC.
Primarily effects the respiratory system.
Ideal for effecting crowds.
Ideal for large areas.
Highest degree of cross contamination.
Grossly effected by environmental factors like wind and ventilation.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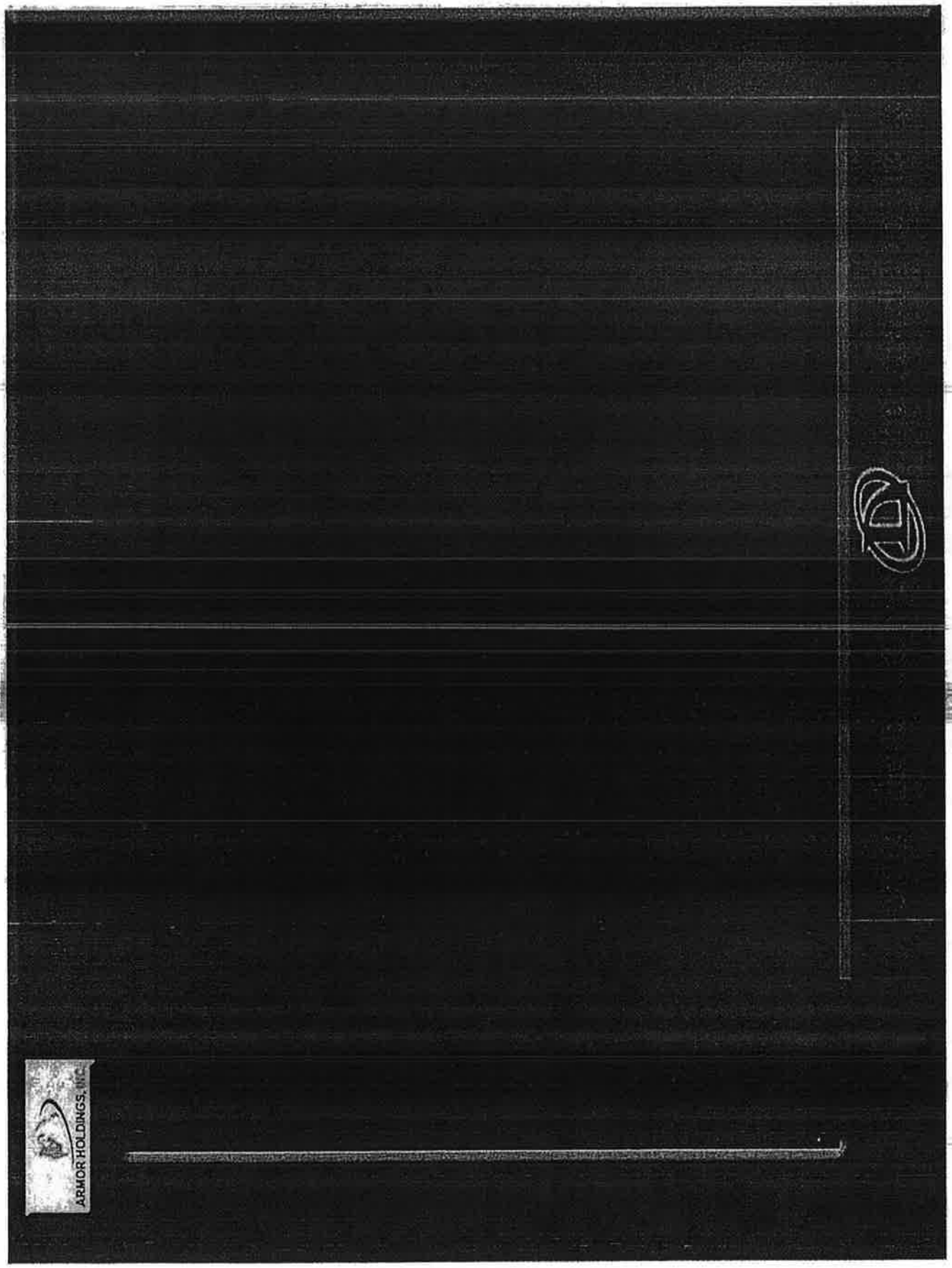
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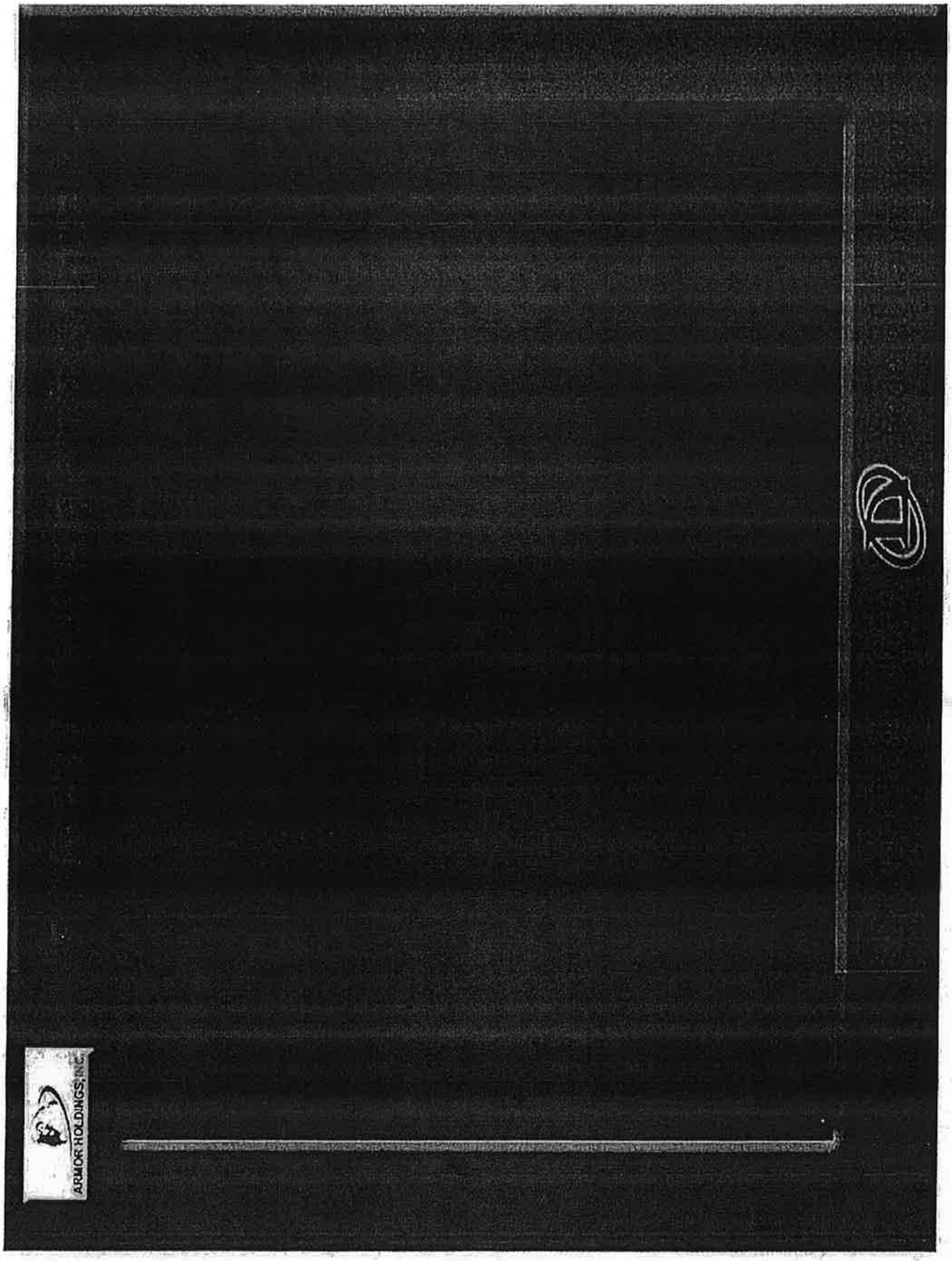
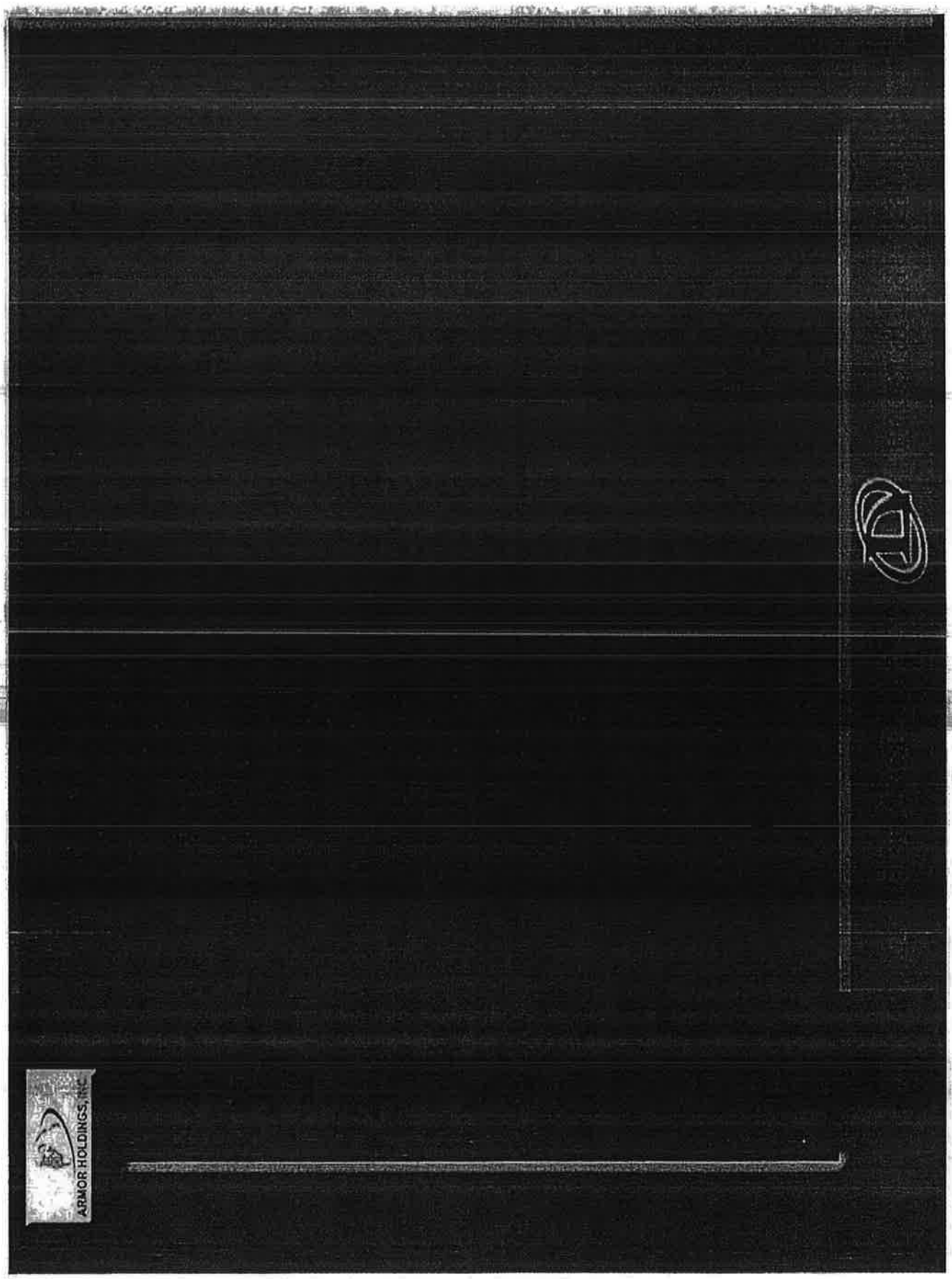

ARMOR HOLDINGS, INC.

ARMOR HOLDINGS, INC

BALLISTIC STREAMS

- Causes temporary visual impairment due to involuntary closure of the eye.
- Target Specific … must contact the subject's eye for maximum effectiveness.
- Minimal effects to the respiratory system (a secondary effect).

ARMOR HOLDINGS, INC.
▲ Suited for individual application.
▲ Provides greater standoff distances for the officer.
▲ Reduced cross contamination.
▲ Less effected by wind, air currents, and rain.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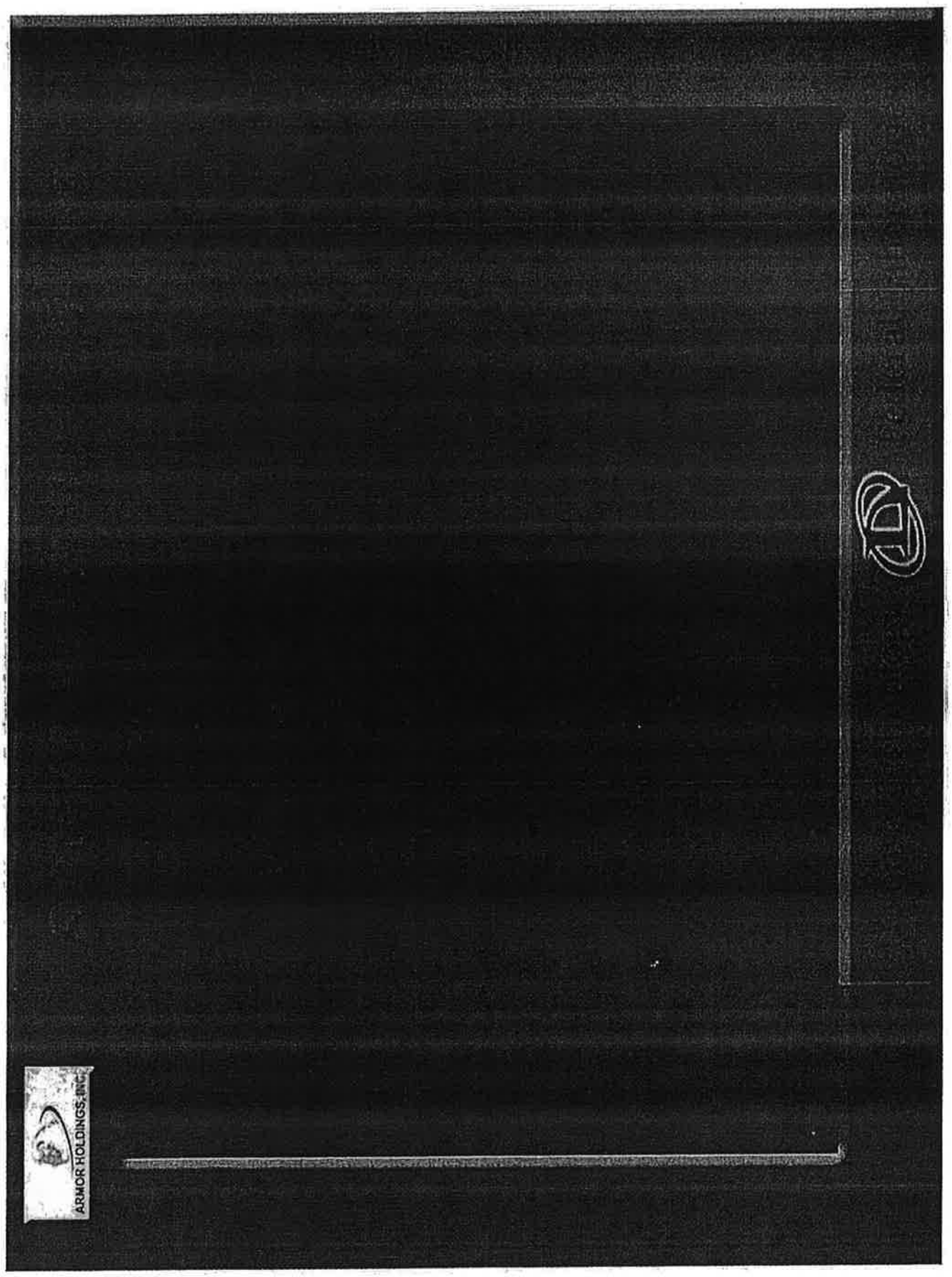
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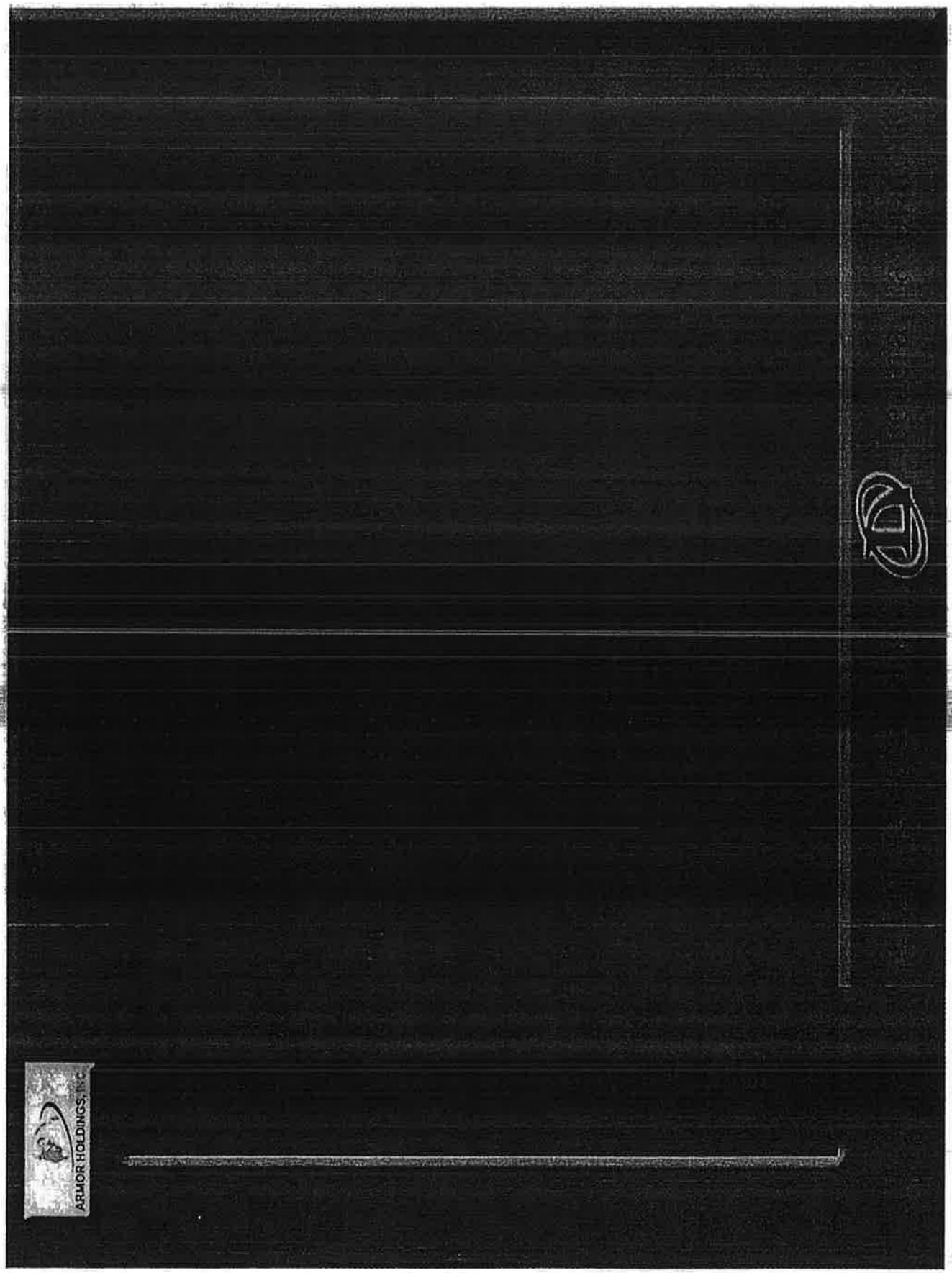

ARMOR HOLDINGS, INC.

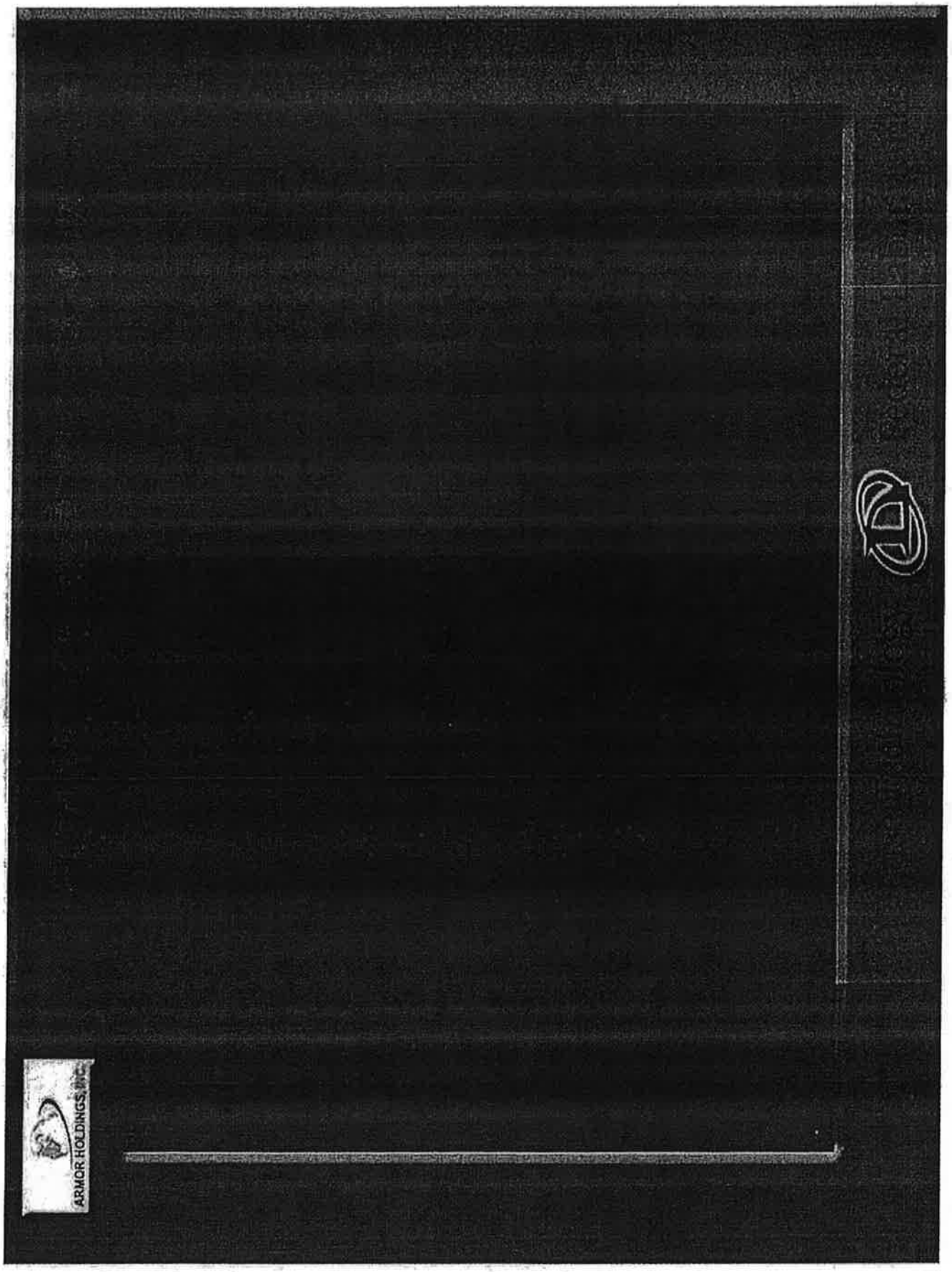
ARMOR HOLDINGS, INC.

FOAM SYSTEM

- For indoor applications … provides the least amount of cross contamination.
- Extremely target specific.
- Suited for sensitive areas where minimal cross contamination is desired: hospitals, courtrooms, etc.

FOAM SYSTEM

- The least desired and expected effect is to the respiratory system.
- Provides minimal standoff distance and usually deployed in close quarters.
- Potential throwback, slippery surfaces, increased collateral contamination, and increased decontamination times.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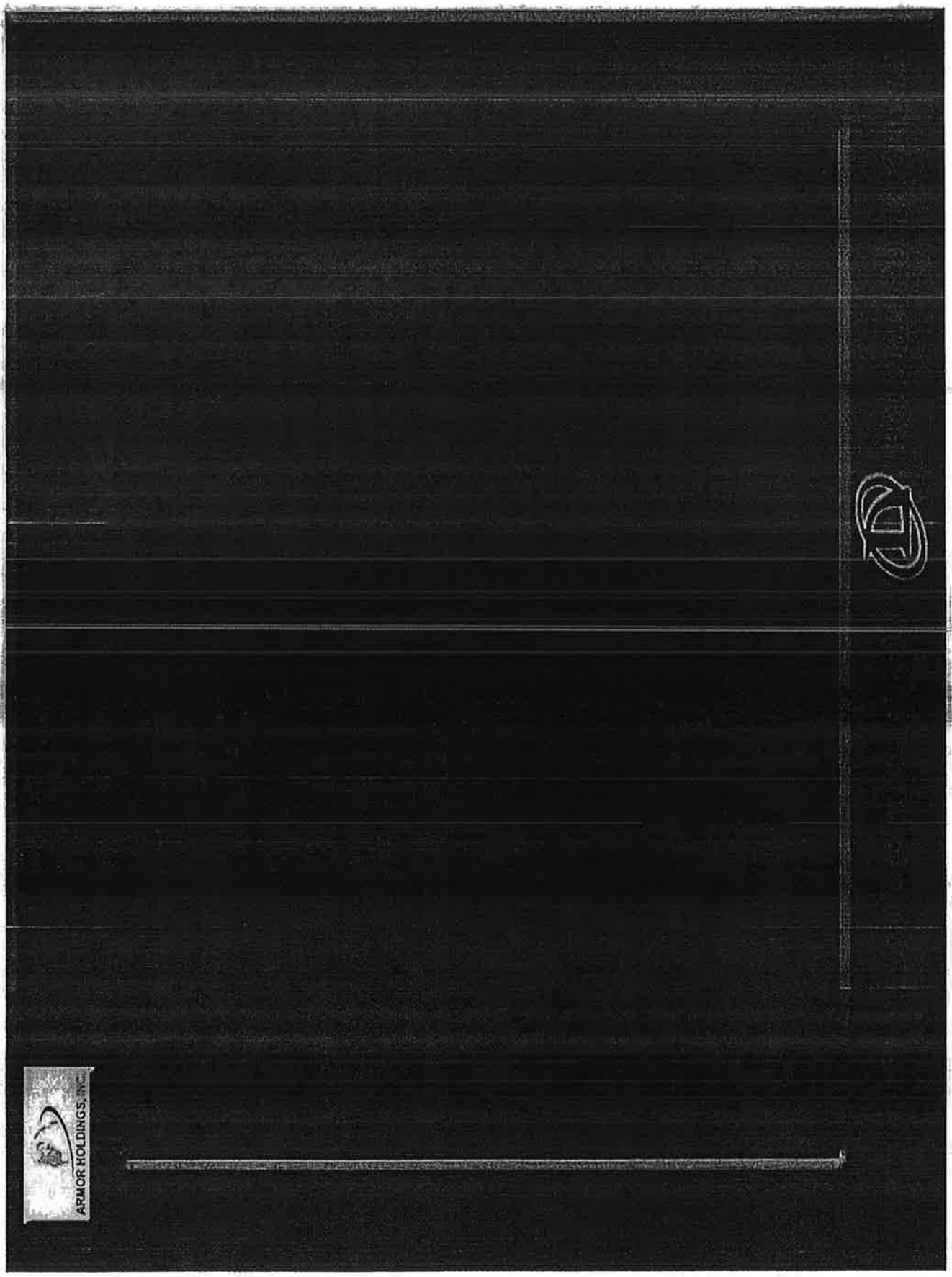
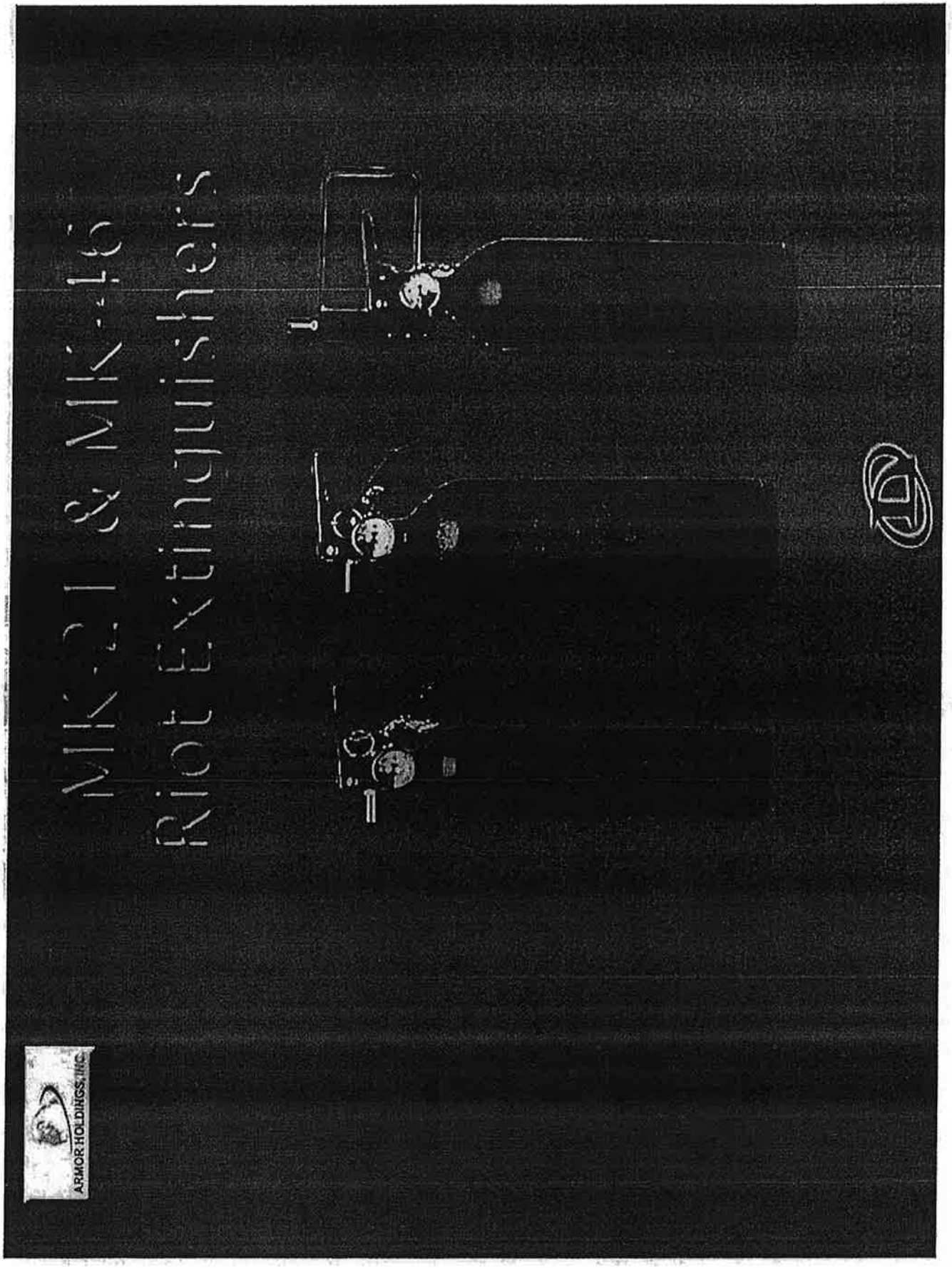

ARMOR HOLDINGS, INC.

SPRAY PATTERNS
Cone and Fog
Recommended Spray Method:
Motion from nose to mouth.
ARMOR HOLDINGS, INC.

Spray Patterns
Ballistic Stream
Recommended Spray
Method:
Motion from ear to ear
ARMOR HOLDINGS, INC.

Spray Patterns
Foam
Recommended Spray Method:
Motion in a circular pattern.
ARMOR HOLDINGS, INC.

High Volume
Delivery Systems
10% OC
PEPPER
MK-9
MAGNUM
1 Pound
OC
ARMOR HOLDINGS, INC.


MK-14 & MK-16
SIDE EJECTION
ARMOR HOLDINGS, INC.

ARMOR HOLDINGS, INC.

Deployment
Considerations
Quick Access
Ergonomics
Retention
Accidental Discharge
Handguns
ARMOR HOLDINGS, INC.

Deployment Considerations
Cross Contamination
Environmental Factors
Wind & Rain
Fans or Ventilation
Heat & Humidity
Mechanical Disturbance
First Defense and Mace products are non-flammable.
ARMOR HOLDINGS, INC.

Target Area Spray Volume

- The primary target when deploying OC is the facial area assuring coverage of the eyes, brow, and mouth.
- One should discharge OC using multiple bursts ensuring delivery directly onto the target area.

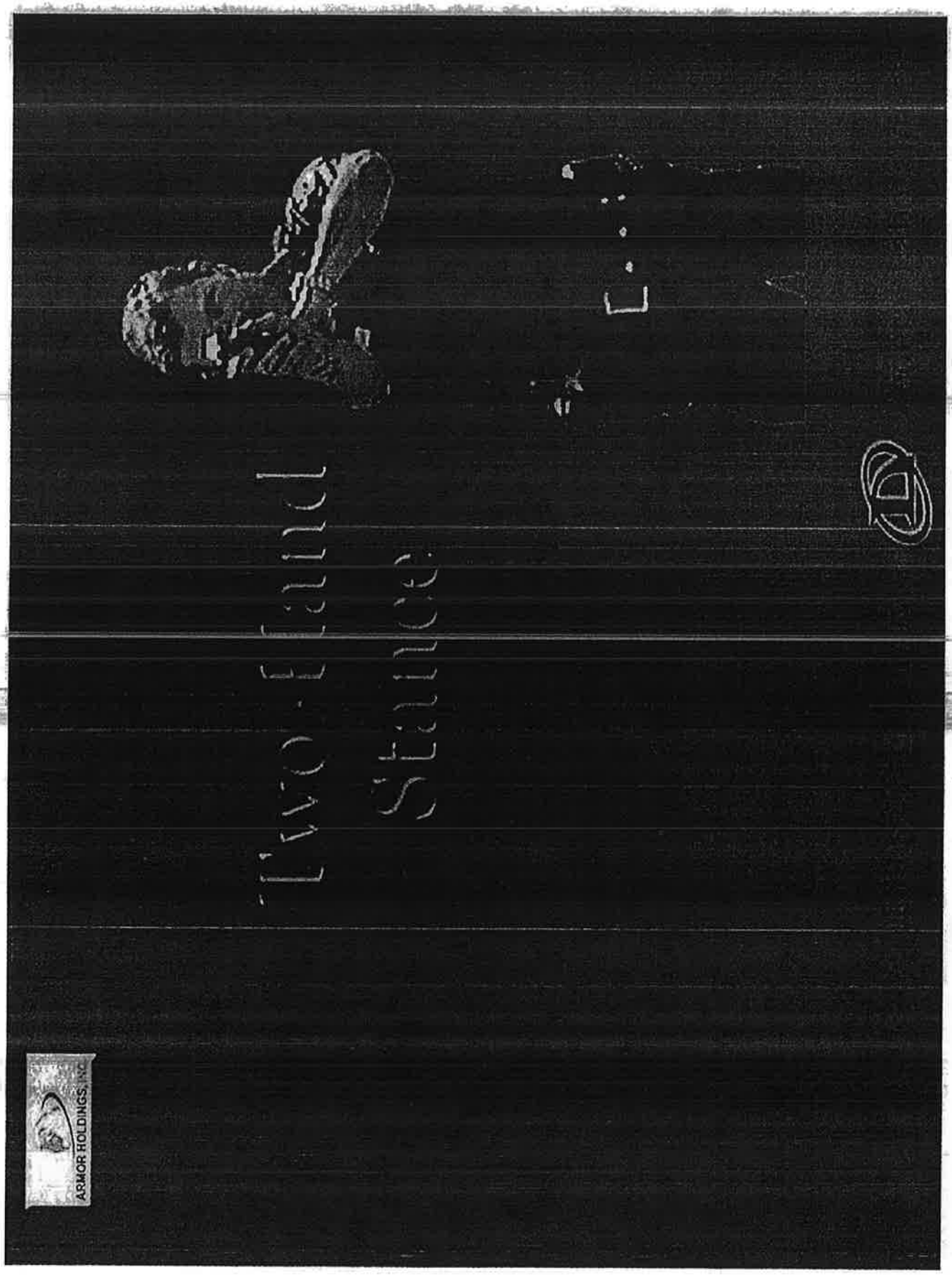
ARMOR HOLDINGS, INC.

Deployment Considerations
ARMOR HOLDINGS, INC.
the subject - determine that the subject is contaminated or that the OC is ineffective and other measures are necessary.
them to get on the ground - end command with "Do it now".
their response - repeat steps 1-3 if required, escalate, or de-escalate.
use handcuffing and approved control techniques.
check subject - start decontamination.

ARMOR HOLDINGS, INC.

Use of Force Options
Situation One: Disturbance
Situation Two: Domestic
Situation Three: Traffic Stop
ARMOR HOLDINGS, INC.

Deployment Tactics
Element of Surprise
Concealment
Proper Grip and Stance
Adequate Delivery
ARMOR HOLDINGS, INC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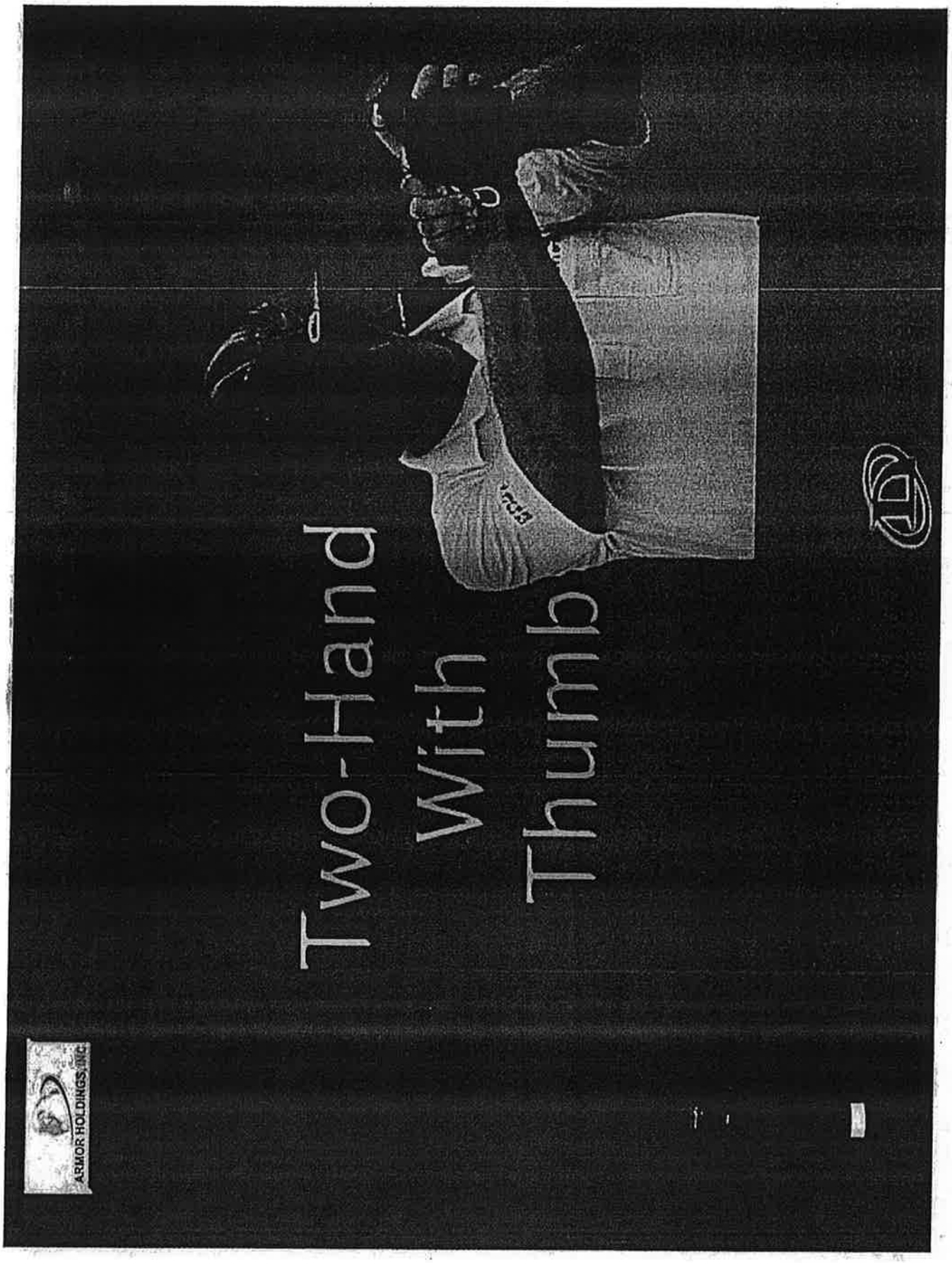
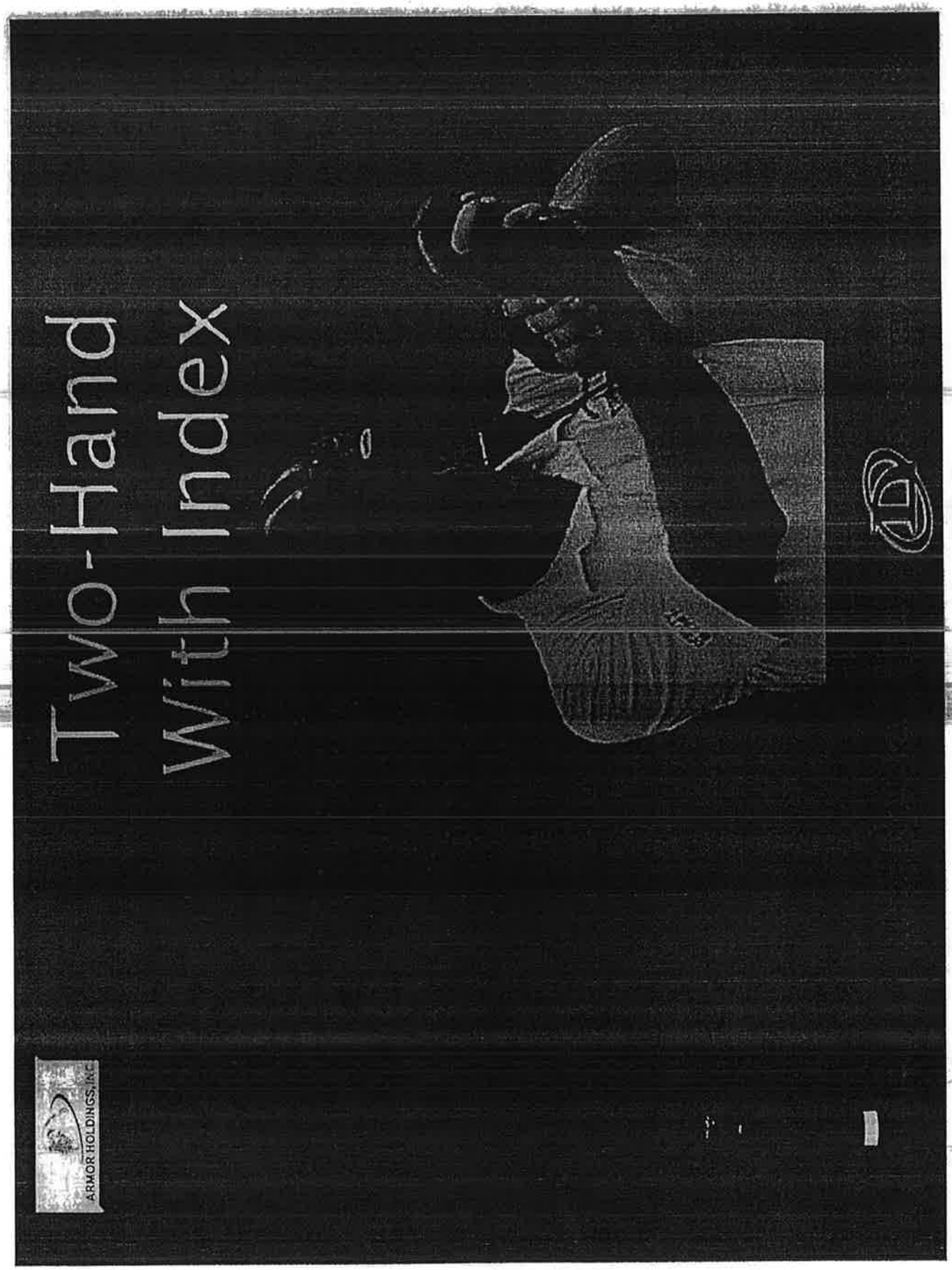
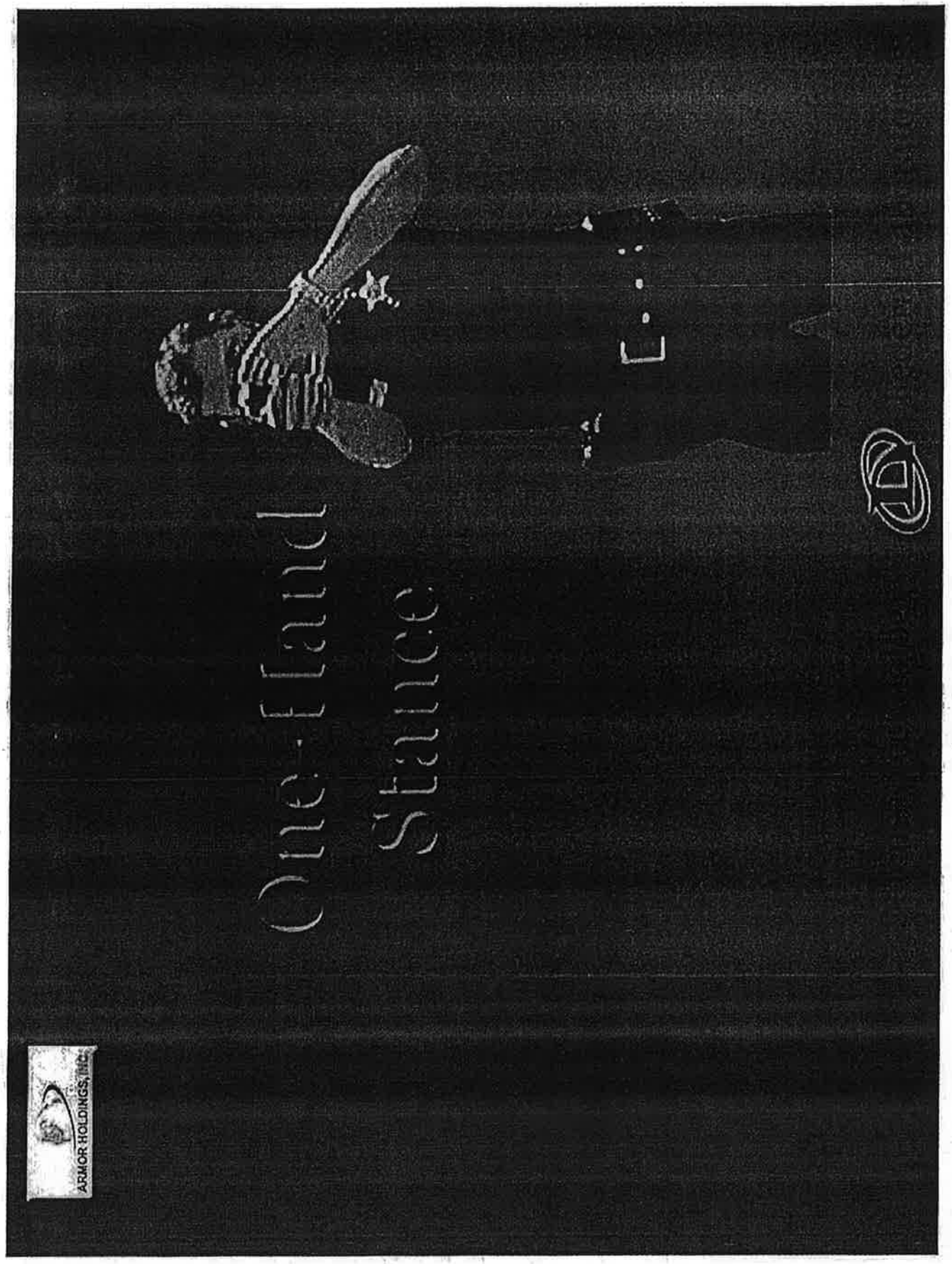
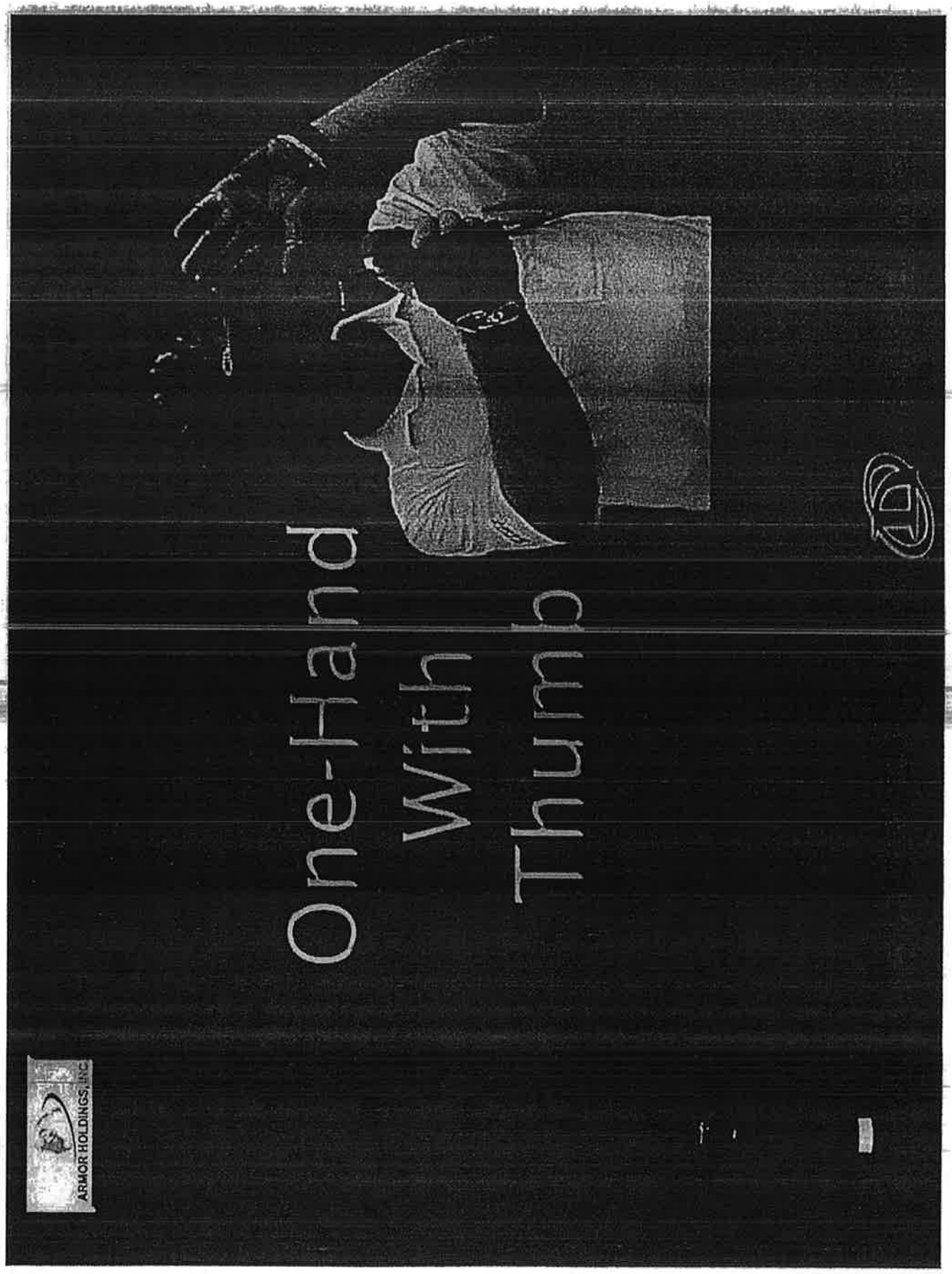

Two-Hand
With
Thumb
ARMOR HOLDINGS, INC.


Two-Hand
With Index
ARMOR HOLDINGS, INC.


Original
Shape
ARMOR HOLDINGS, INC.


One-Hand
With
Thumb
ARMOR HOLDINGS, INC

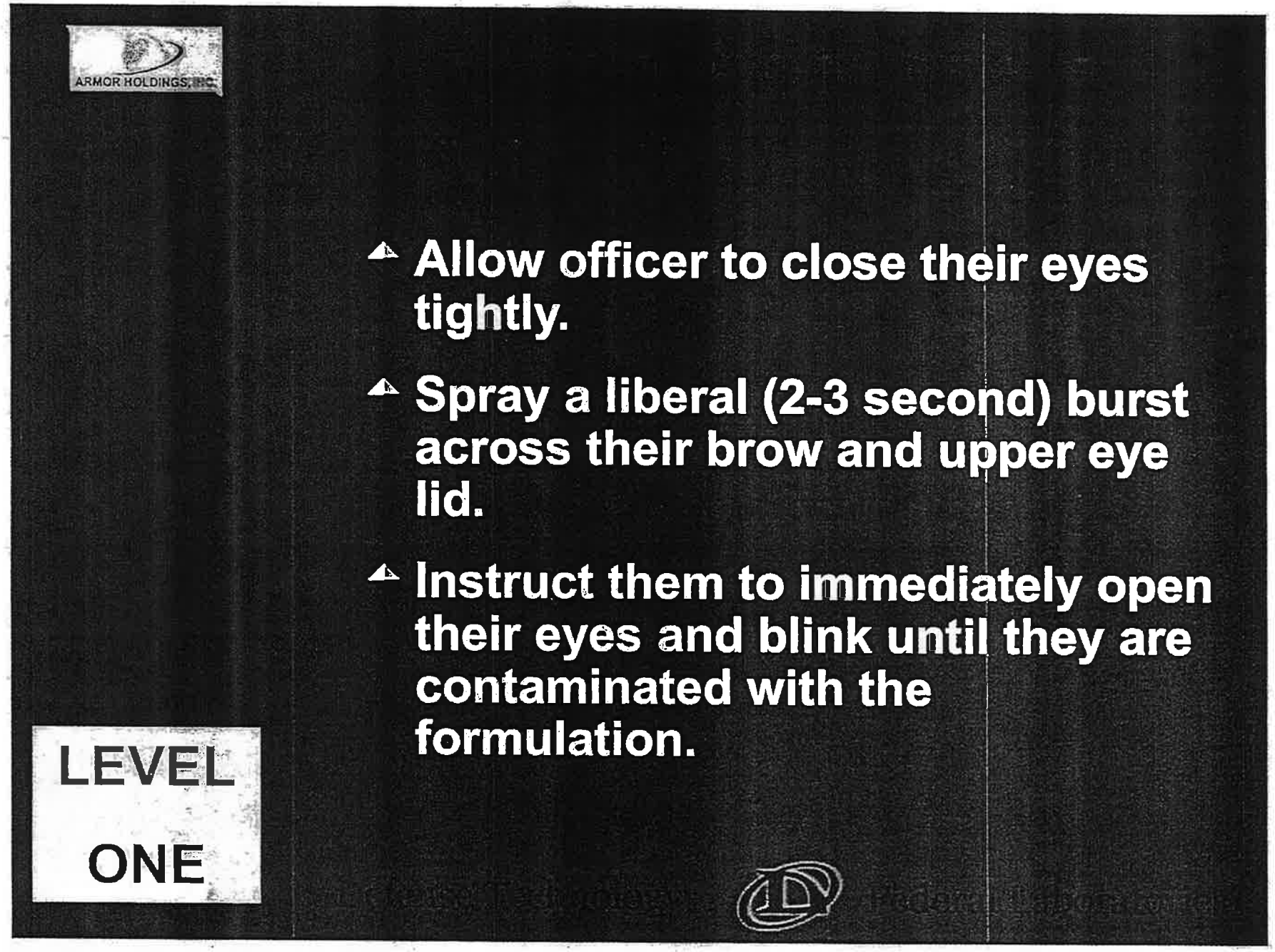
Two-Hand
Conceal
ARMOR HOLDINGS, INC.

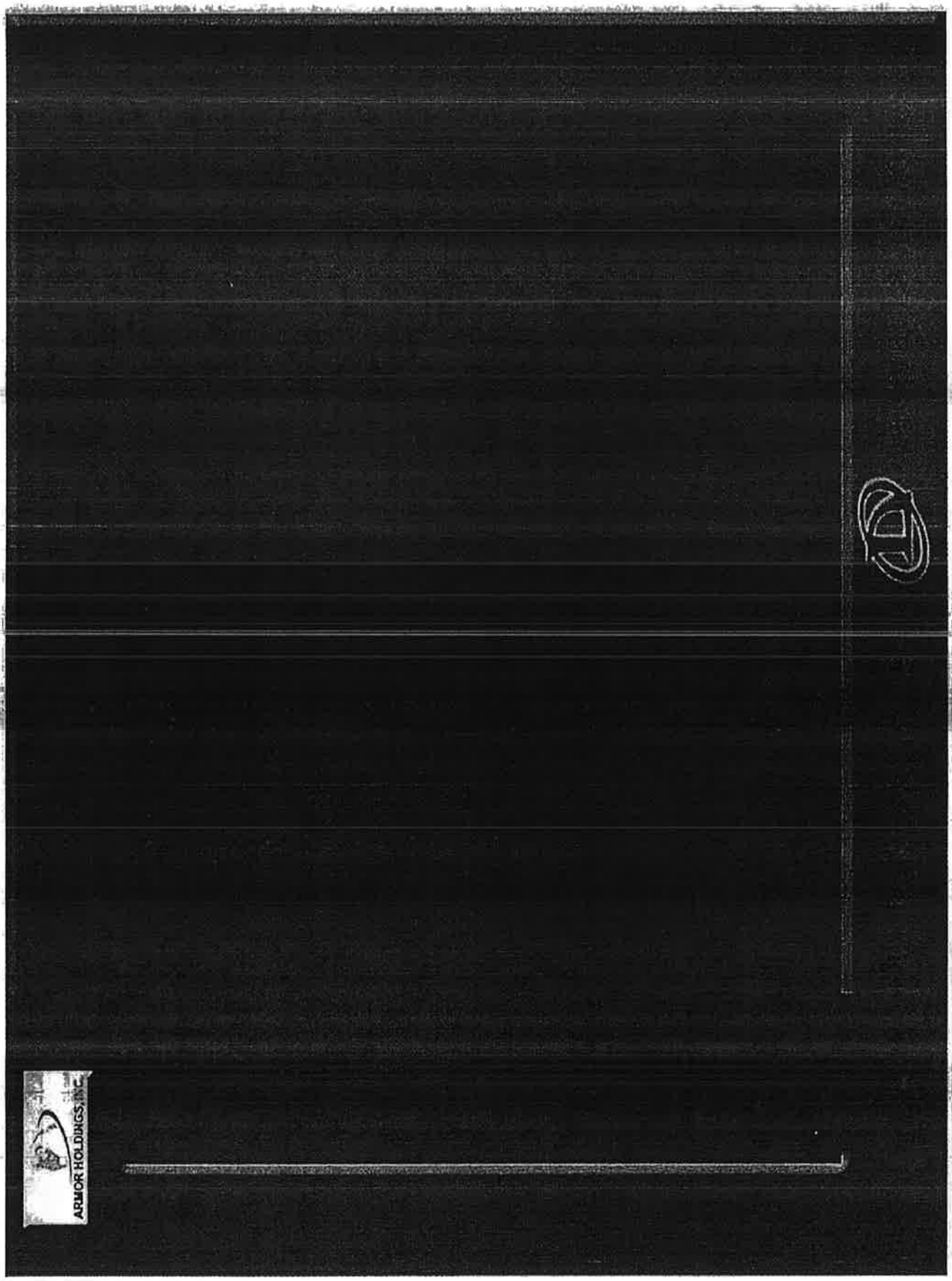
Low Profile
Carry
ARMOR HOLDINGS, INC.

LEVELS OF CONTAMINATION
Level One
Level Two
Level Three
ARMOR HOLDINGS, INC.
Defense Technology

Level One Contamination

- Direct physical contact of the OC or chemical formulation.
- The result of direct contact to the facial area – *spraying a subject directly in the face.*

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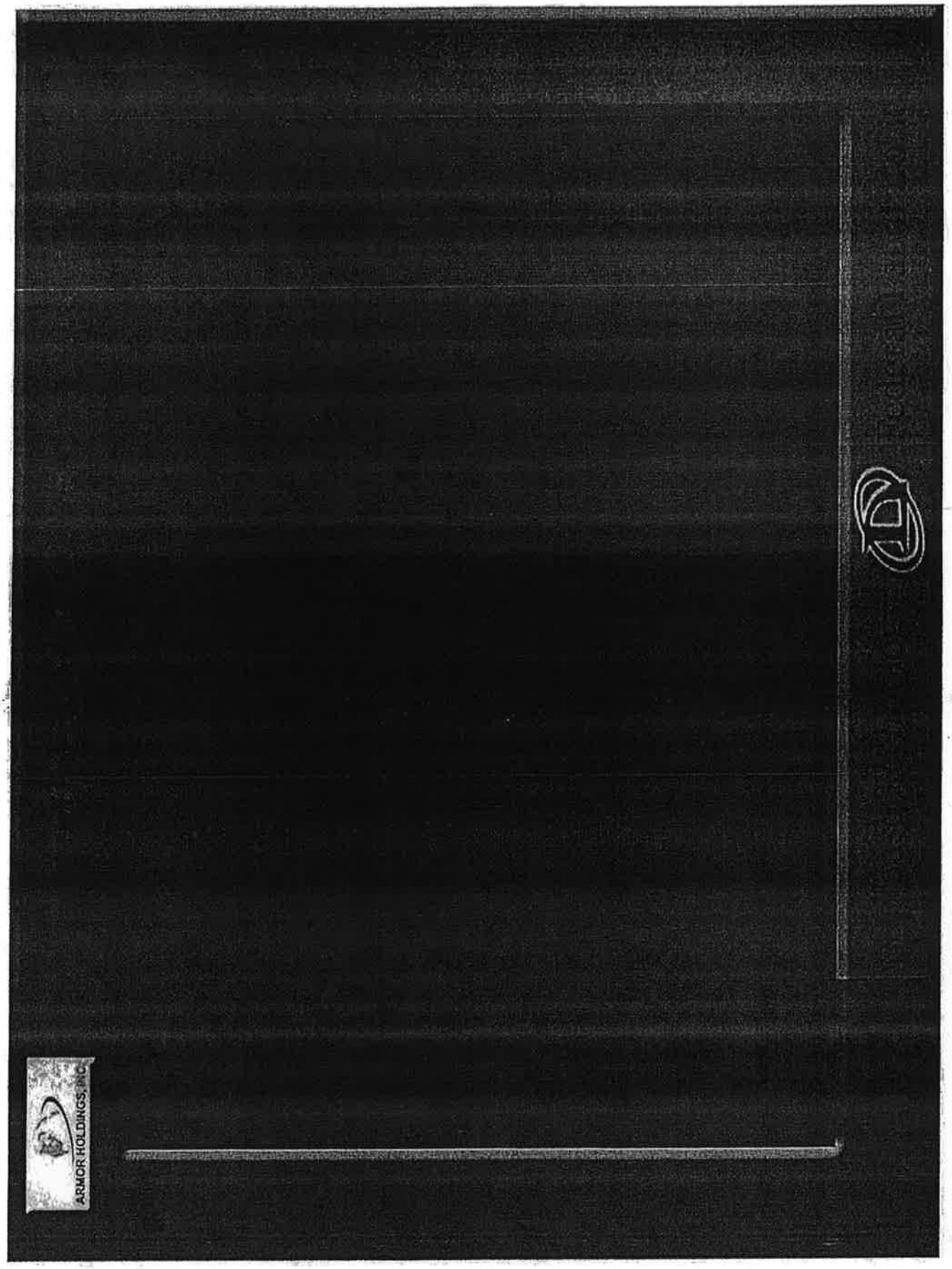
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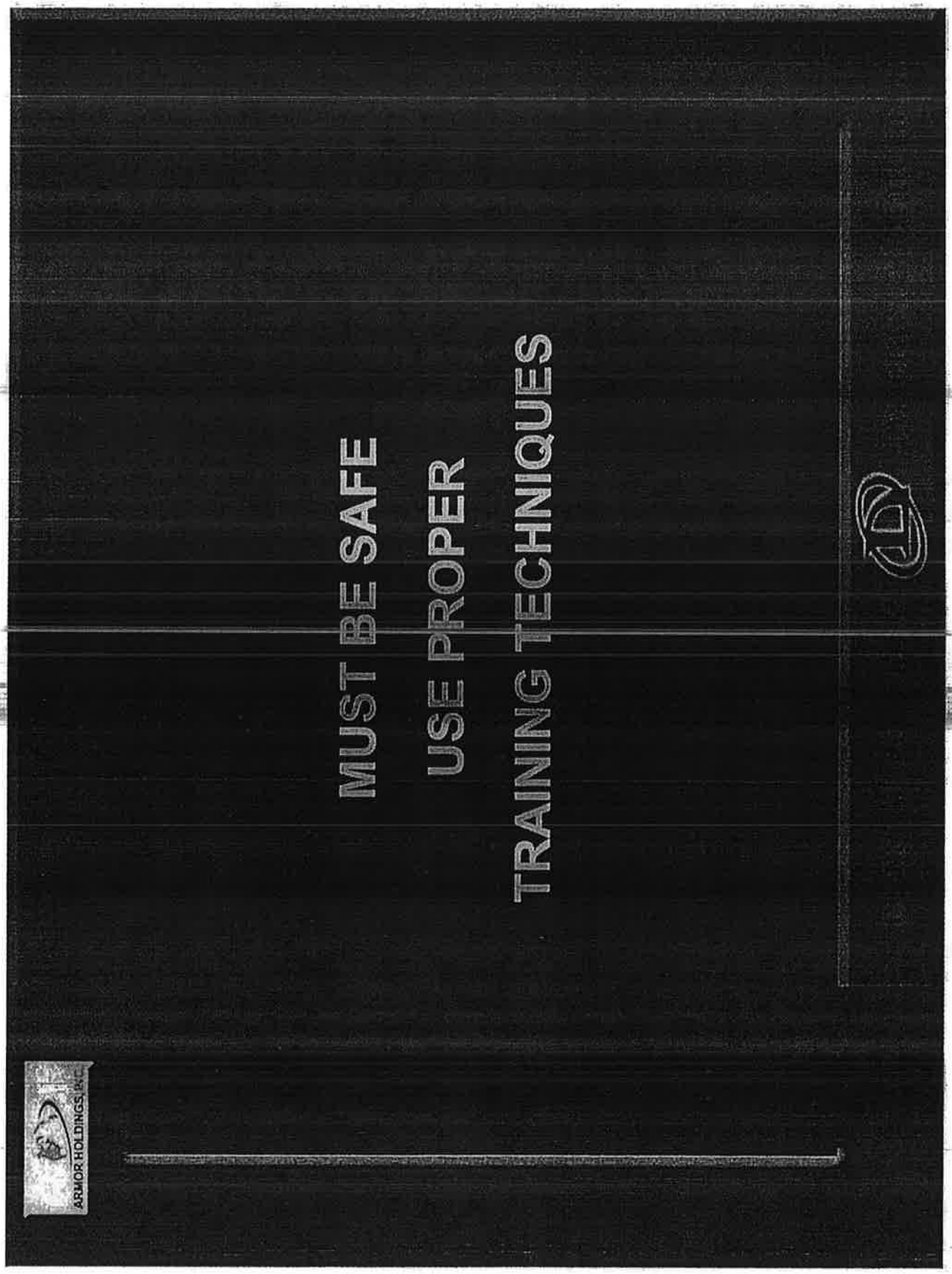
MUST BE SAFE
USE PROPER
TRAINING TECHNIQUES
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Level Two Contamination

- Indirect or secondary contact.
- The result of attempting to control another person, or object that has had a Level 1 contamination – *moving in to control a subject who has just been contaminated.*

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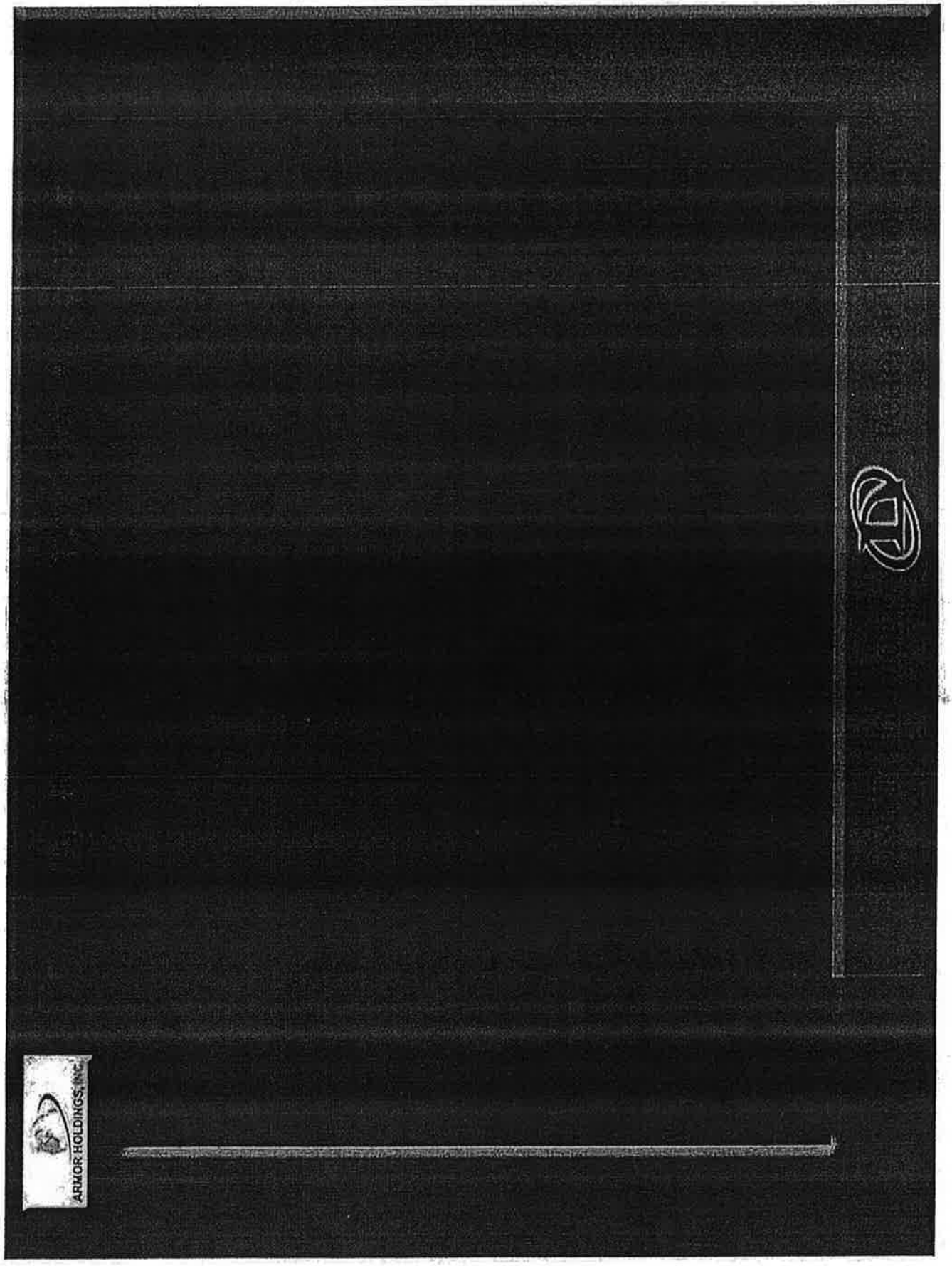
LEVEL TWO
Liberally spray a drag "dummy" or similar training aid.
Instruct the officer(s) to physically engage, secure and transport it, forcing contact to the expose surface, contaminating them.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Level three contamination

- An area contamination with an OC or chemical aerosol.
- The result of *entering a contaminated zone or area.*

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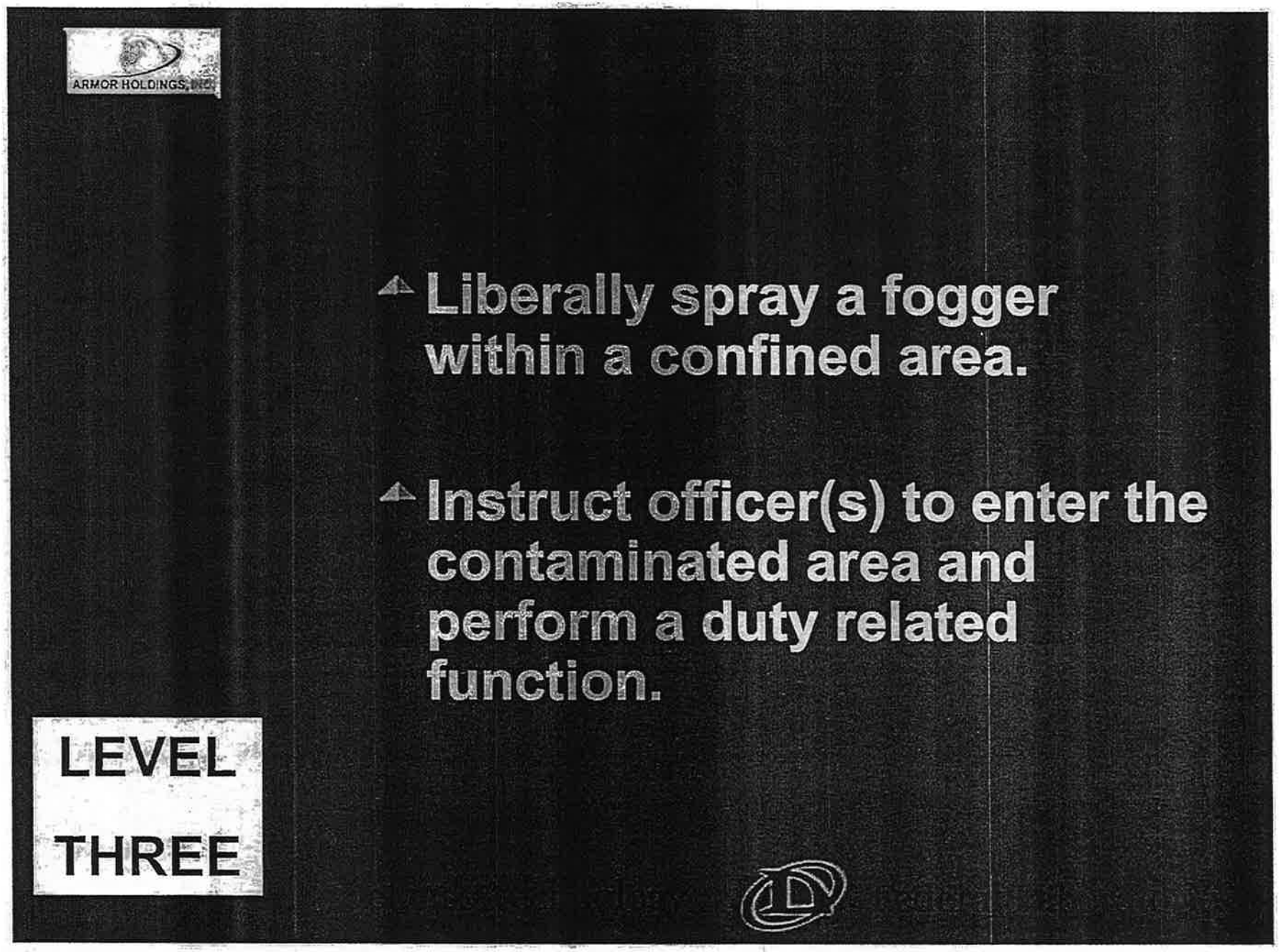

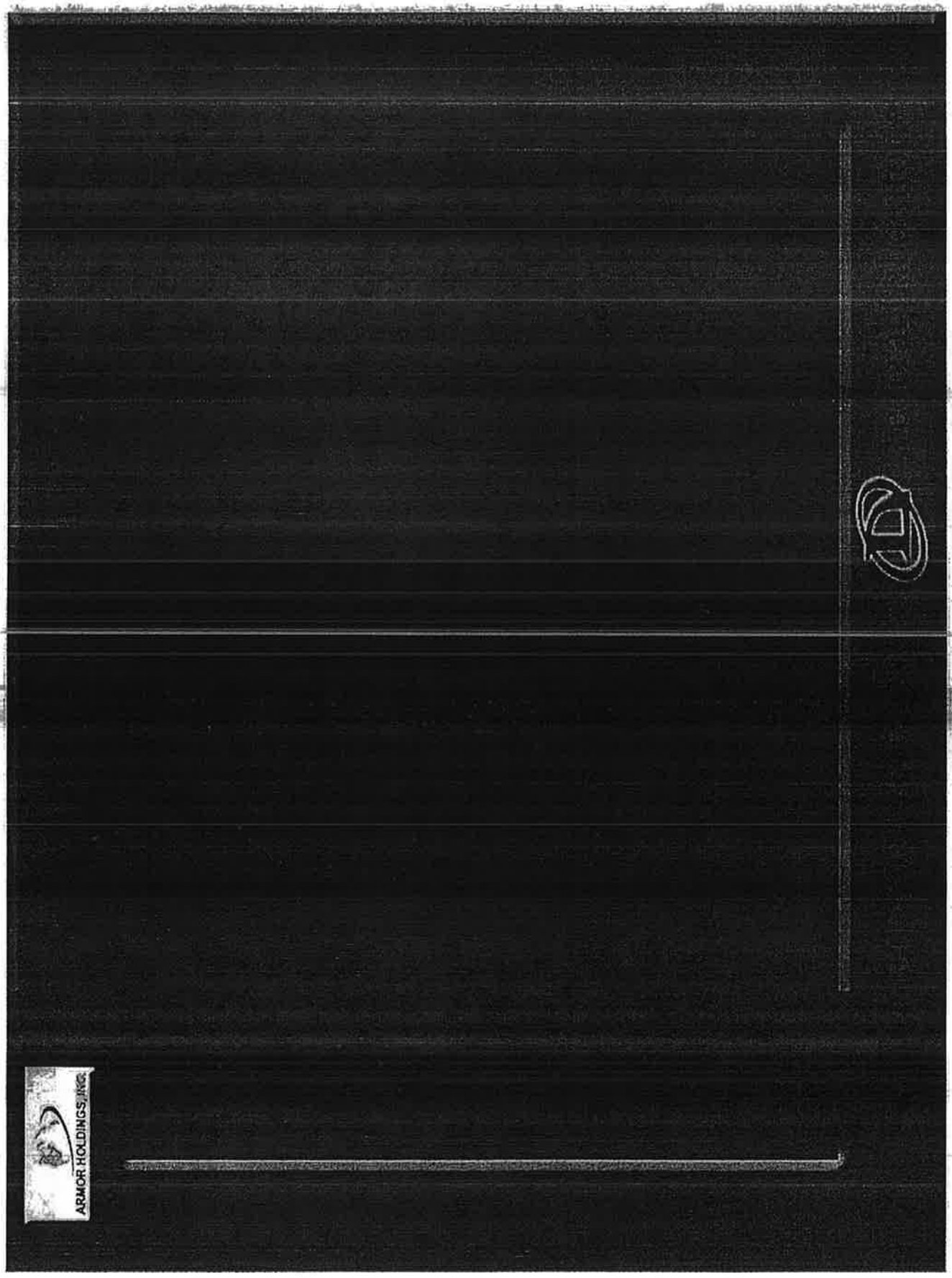
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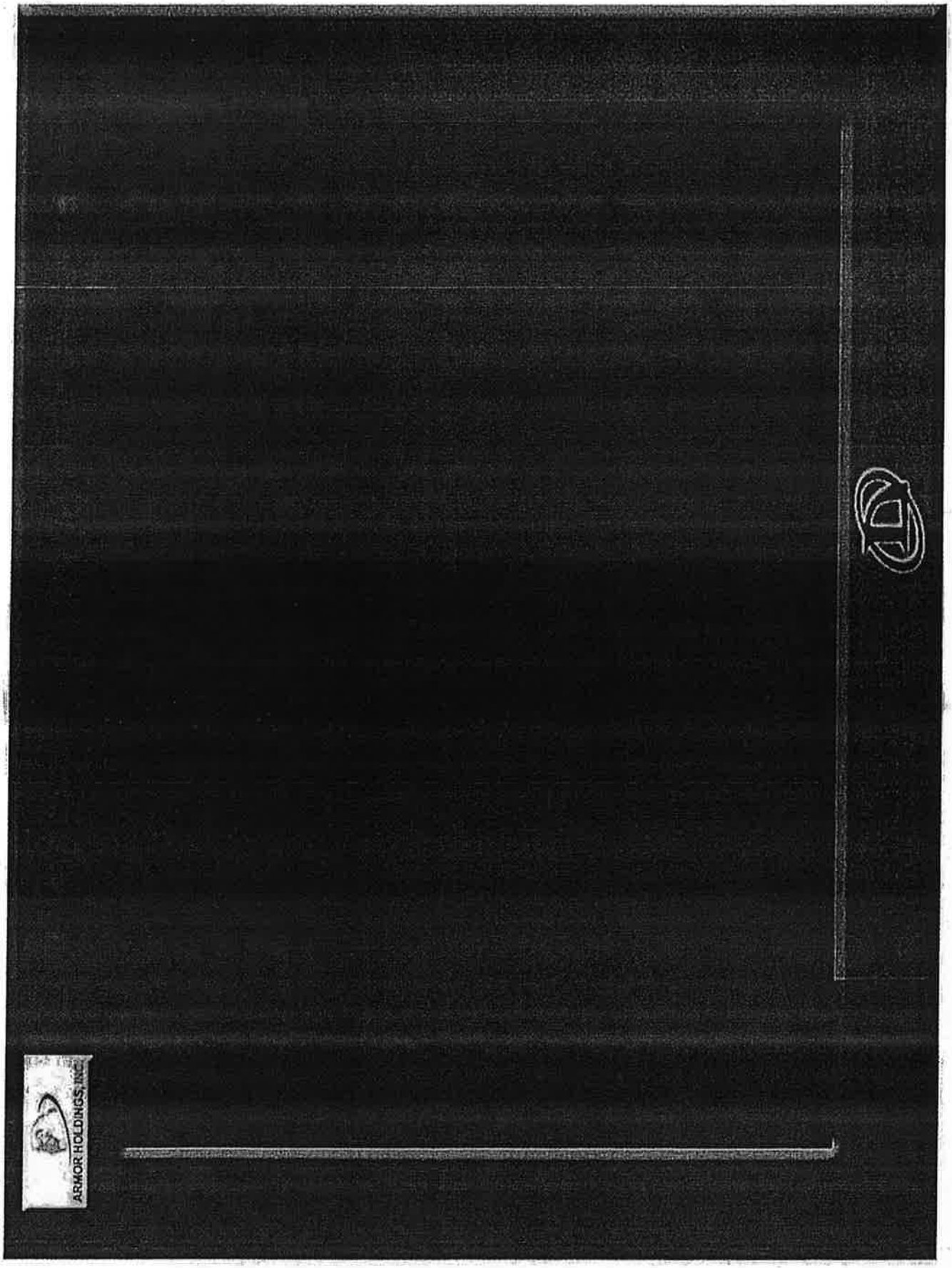
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Personal Decontamination
Step 1 Remove subject from contaminated area and establish verbal rapport.
Expose subject to fresh air and face into the wind.
Have the subject stay still, encourage to breath normally and relax as much as possible.
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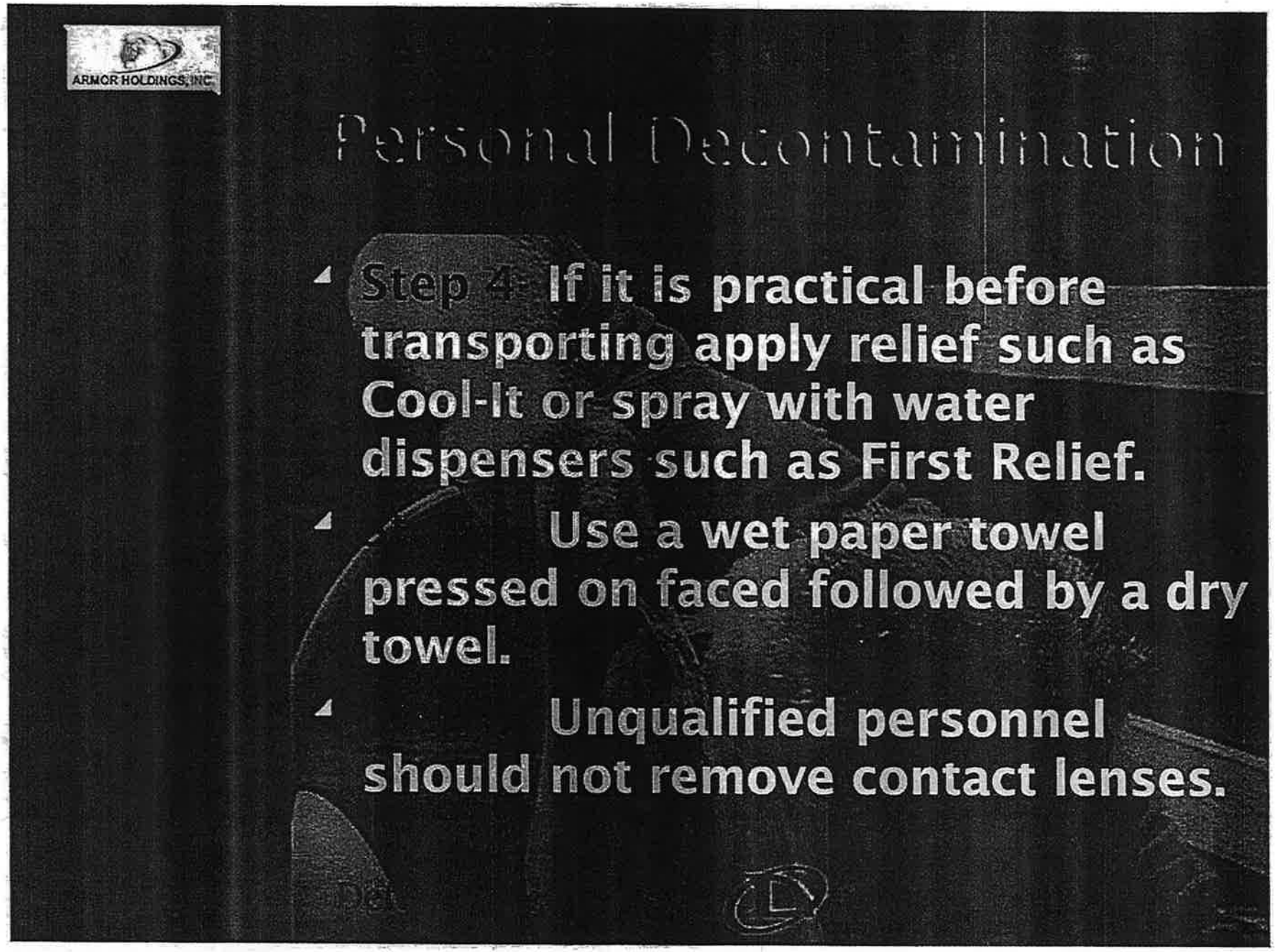

Personal
Decontamination
When available, have subject flush eyes with copious amounts of cool water.
Encourage subject to force open their eyes in order to flush out the OC particulates.
Non-oil-based soap, shampoo or detergent can be used to help remove resin from the skin.
DO NOT use any creams, salves, or oils.
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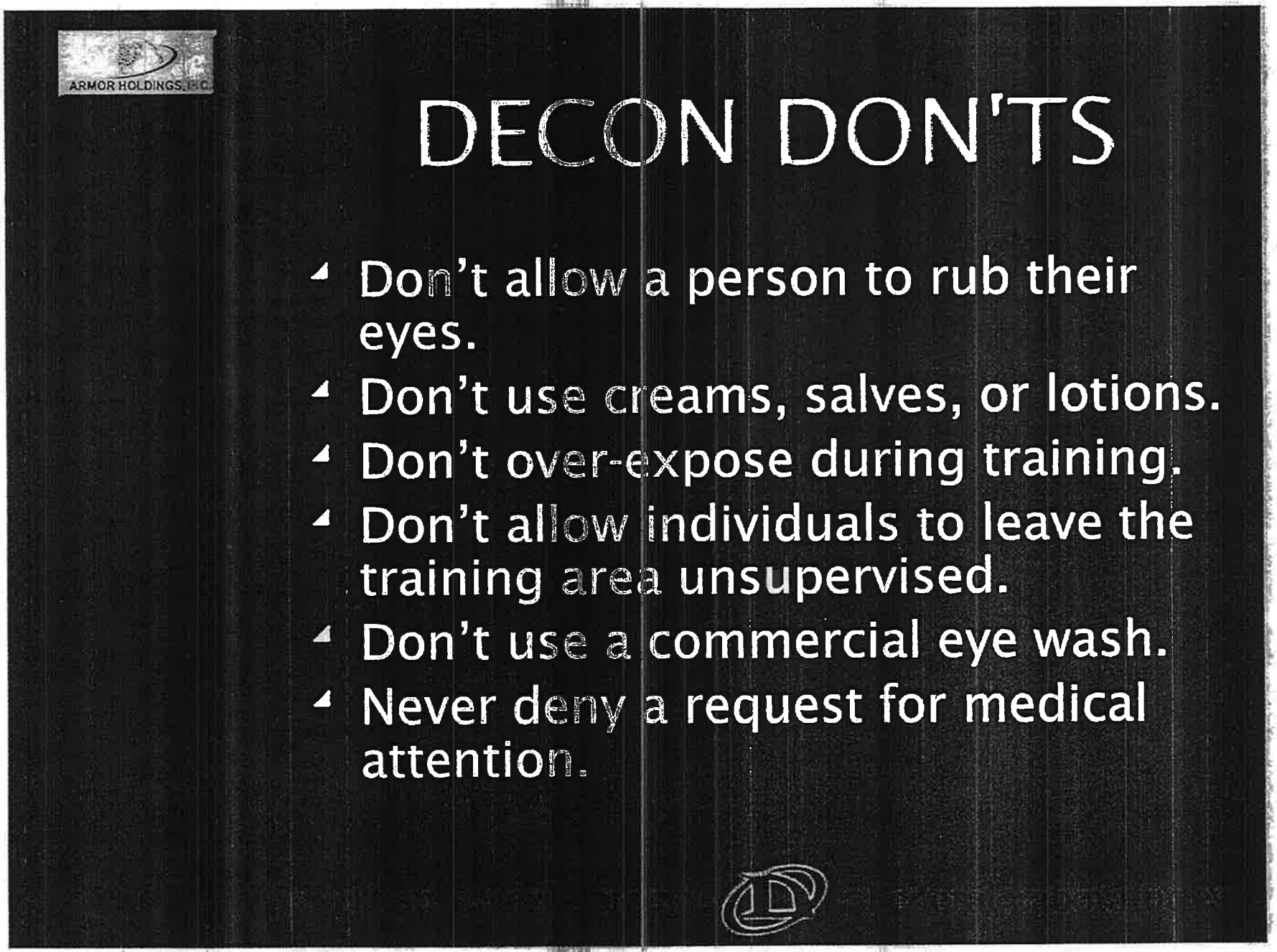
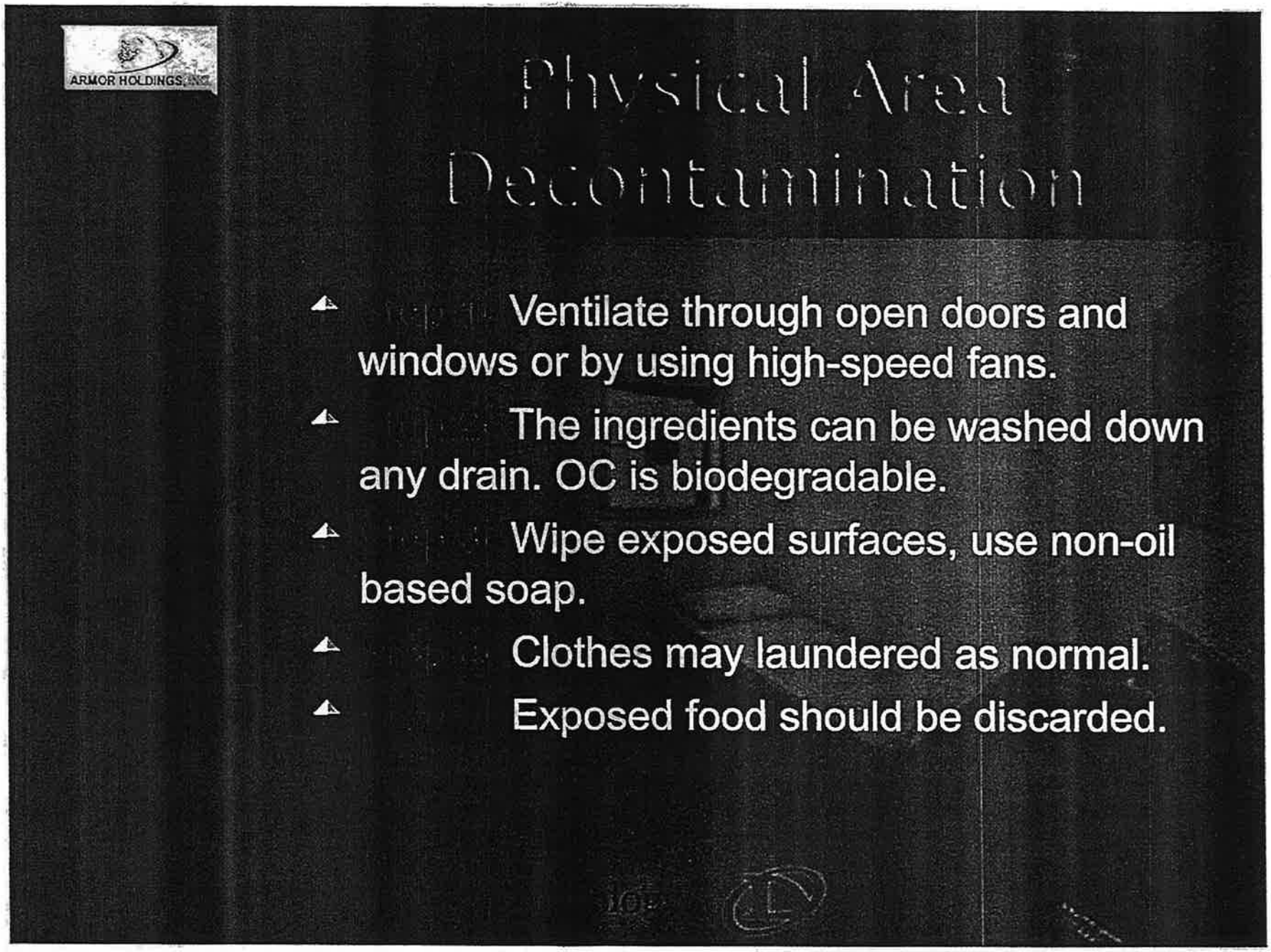
RECOVERY

- Usually an individual will recover within one hour, but vast improvements should be noted within 20-30 minutes.
- Anyone not exhibiting significant improvement after one hour should be closely monitored to ensure continued recovery.

Decontamination
Aids
COOL-IT!
BRAND
Herbal
Extract
WIPES
COOL-IT
ARMOR HOLDINGS, INC

Decontamination
Aids
DISTILLED WATER
SOFT MIST DELIVERY
PROVIDES RELIEF
DEMONSTRATES COMPASSION
FIRST RELIEF
ARMOR HOLDINGS, INC.





Sudden In-Custody Death

- Sudden in-custody death is not a new phenomenon nor is it attributable to the use of OC. Rather, sudden in-custody death can occur at any time for a variety of reasons.
- Recognition of risk indicators.
  - Bizarre / Violent Behavior
  - Obesity
  - Drugs and Alcohol
  - Ineffectiveness of spray
  - Use of positional restraint techniques

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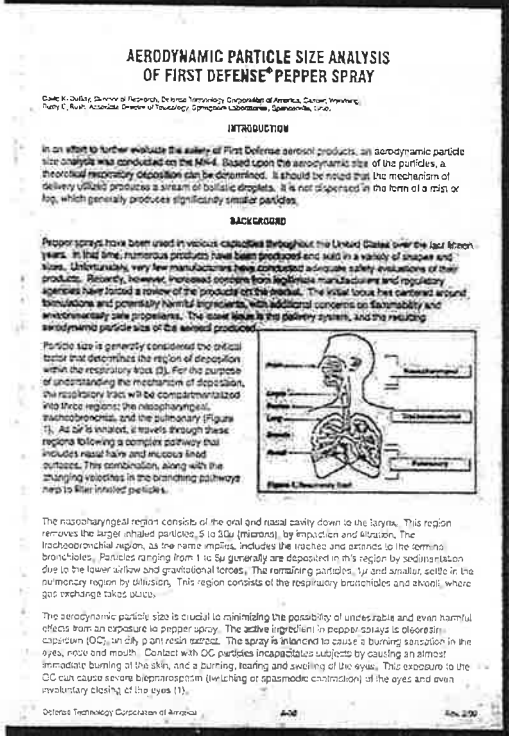
AERODYNAMIC PARTICULATE SIZE ANALYSIS OF FIRST DEFENSE PEPPER SPRAY



AERODYNAMIC PARTICLE SIZE ANALYSIS
OF FIRST DEFENSE® PEPPER SPRAY

David K. DuBay, Director of Research, AHI

Rusty Rush, Associate Director of Toxicology, Springborn Laboratories

INTRODUCTION

In an effort to further evaluate the safety of First Defense aerosol products, an aerodynamic particle size analysis was conducted on the MK-4. Based upon the aerodynamic size of the particles, a theoretical respiratory deposition can be determined. It should be noted that the mechanism of delivery utilized produces a stream of ballistic droplets. It is not dispersed in the form of a mist or fog, which generally produces significantly smaller particles.

BACKGROUND

Pepper sprays have been used in various capacities throughout the United States over the last fifteen years. In that time, numerous products have been produced and sold in a variety of shapes and sizes. Unfortunately, very few manufacturers have conducted adequate safety evaluations of their products. Recently, however, increased concerns from legitimate manufacturers and regulatory agencies have forced a review of the products on the market. The initial focus has centered around formulations and potentially harmful ingredients, with additional concerns on flammability and environmentally safe propellants. The lower focus is the delivery system, and the resulting aerodynamic particle size of the aerosol produced.

Particle size is generally considered the critical factor that determines the region of deposition within the respiratory tract (3). For the purpose of understanding the mechanism of deposition, the respiratory tract will be compartmentalized into three regions: the nasopharyngeal, tracheobronchial, and the pulmonary (Figure 1). As air is inhaled, it travels through these regions following a complex pathway that includes nasal hairs and mucous lined surfaces. This combination, along with the changing velocities in the branching pathways help to filter inhaled particles.

The nasopharyngeal region consists of the oral and nasal cavity down to the larynx. This region removes the larger inhaled particles, 5 to 30µ (microns), by impaction and filtration. The tracheobronchial region, as the name implies, includes the trachea and extends to the terminal bronchioles. Particles ranging from 1 to 5µ generally are deposited in this region by sedimentation due to the lower airflow and gravitational forces. The remaining particles, 1µ and smaller, settle in the pulmonary region by diffusion. This region consists of the respiratory bronchioles and alveoli, where gas exchange takes place.

The aerodynamic particle size is crucial to minimizing the possibility of undesirable and even harmful effects from an exposure to pepper spray. The active ingredient in pepper sprays is oleoresin capsicum (OC), an oily plant resin extract. The spray is intended to cause a burning sensation in the eyes, nose and mouth. Contact with OC particles incapacitates subjects by causing an almost immediate burning of the skin, and a burning, tearing and swelling of the eyes. This exposure to the OC can cause severe blepharospasm (twitching or spasmodic contraction) of the eyes and even involuntary closing of the eyes (1).

Defense Technology Corporation of America — 4-08 — Rev 2/99

OC particulate size of the ballistic stream delivery system for the duty size canisters is of a size that would be trapped in the respiratory system prior to reaching the pulmonary area where O^2 / CO^2 exchange takes place.

HEALTH RISK ANALYSIS

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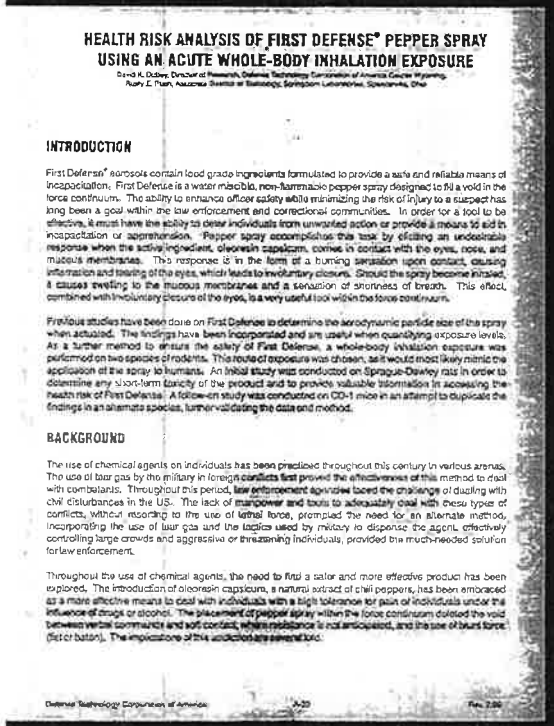
HEALTH RISK ANALYSIS OF FIRST DEFENSE USING AN ACUTE WHOLE-BODY INHALATION EXPOSURE



HEALTH RISK ANALYSIS OF FIRST DEFENSE® PEPPER SPRAY USING AN ACUTE WHOLE-BODY INHALATION EXPOSURE

David K. DuBay, Director of Research, Defense Technology Corporation of America, Cheyenne, Wyoming
Rusty E. Rush, Associate Director of Toxicology, Springborn Laboratories, Spencerville, Ohio

INTRODUCTION

First Defense® aerosols contain food grade ingredients formulated to provide a safe and reliable means of incapacitation. First Defense is a water miscible, non-flammable pepper spray designed to fill a void in the force continuum. The ability to enhance officer safety while minimizing the risk of injury to a suspect has long been a goal within the law enforcement and correctional communities. In order for a tool to be effective, it must have the ability to deter individuals from unwanted action or provide a means to aid in incapacitation or apprehension. Pepper spray accomplishes this task by eliciting an undesirable response when the active ingredient, oleoresin capsicum, comes in contact with the eyes, nose, and mucous membranes. This response is in the form of a burning sensation upon contact, causing inflammation and tearing of the eyes, which leads to involuntary closure. Should the spray become inhaled, it causes swelling to the mucous membranes and a sensation of shortness of breath. This effect, combined with involuntary closure of the eyes, is a very useful tool within the force continuum.

Previous studies have been done on First Defense to determine the aerodynamic particle size of the spray when actuated. The findings have been incorporated and are useful when quantifying exposure levels. As a further method to ensure the safety of First Defense, a whole-body inhalation exposure was performed on two species of rodents. This route of exposure was chosen, as it would most likely mimic the application of the spray to humans. An initial study was conducted on Sprague-Dawley rats in order to determine any short-term toxicity of the product and to provide valuable information in assessing the health risk of First Defense. A follow-on study was conducted on CD-1 mice in an attempt to duplicate the findings in an alternate species, further validating the data and method.

BACKGROUND

The use of chemical agents on individuals has been practiced throughout this century in various arenas. The use of tear gas by the military in foreign conflicts first proved the effectiveness of this method to deal with combatants. Throughout this period, law enforcement agencies faced the challenge of dealing with civil disturbances in the US. The lack of manpower and tools to adequately deal with these types of conflicts, without resorting to the use of lethal force, prompted the need for an alternate method. Incorporating the use of tear gas and the tactics used by military to dispense the agent, effectively controlling large crowds and aggressive or threatening individuals, provided the much-needed solution for law enforcement.

Throughout the use of chemical agents, the need to find a safer and more effective product has been explored. The introduction of oleoresin capsicum, a natural extract of chili peppers, has been embraced as a more effective means to deal with individuals with a high tolerance for pain or individuals under the influence of drugs or alcohol. The placement of pepper spray within the force continuum deleted the void between verbal commands and soft contact, where resistance is not anticipated, and the use of blunt force (fist or baton). The implications of this addition are several fold.

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David K. DuBay, Director of Research, AHI

Rusty Rush, Associate Director of Toxicology, Springborn Laboratories

The potential acute health risk of using First Defense, a water based formulation, from an inhalation exposure (being inhaled) would appear to be extremely minimal.

HEALTH RISK ANALYSIS

Policy and Procedures

- Comprehensive polices should be in place.
- Policy should address the justification for use.
- Correlation to the agency's Use of Force Continuum.
- Qualifications for certifying authorized users.
- Reporting requirements.

Risk Management to Avoid Civil Liability

- Only officers trained in the use of OC, should be permitted to carry it.
- Sound policies and procedures should be in place.
- Training should require some type of exposure.
- Provide decontamination whenever possible.
- Avoid positional restraint if possible.
- Provide medical attention when required.

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Documentation

- Proper Deployment
- Arrest and Restraint
- Decontamination
- Handling and Recovery

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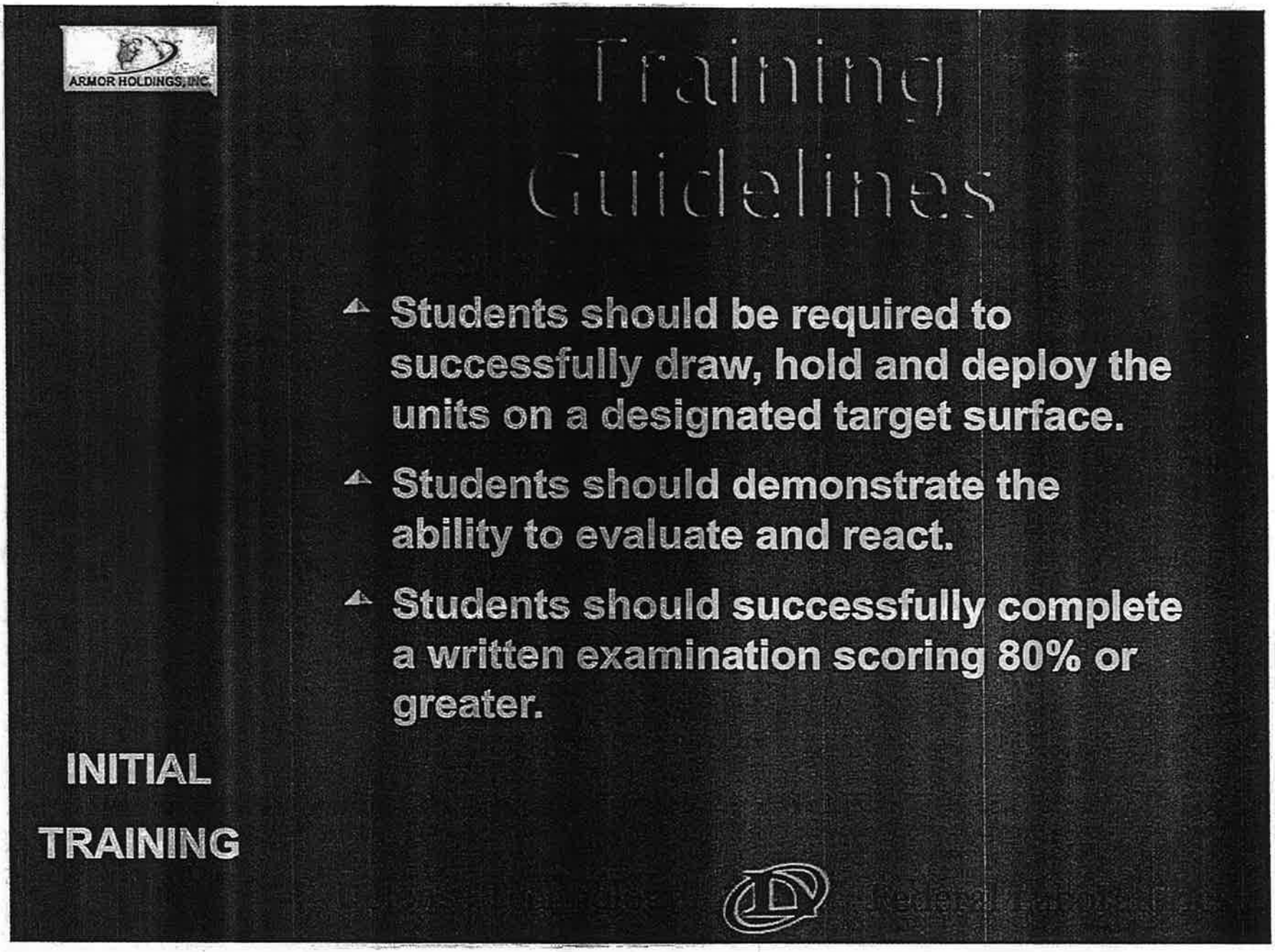
INITIAL
TRAINING
Guidelines
Initial training involving recruits or sworn personnel must be comprehensive and should include exposure.
Emphasis should be on the following:
Department policy and procedures.
Drills and practice using inert training units.
First aid and decontamination.
Exposure and practical drills.
Train with delivery system used, including high volume delivery systems.



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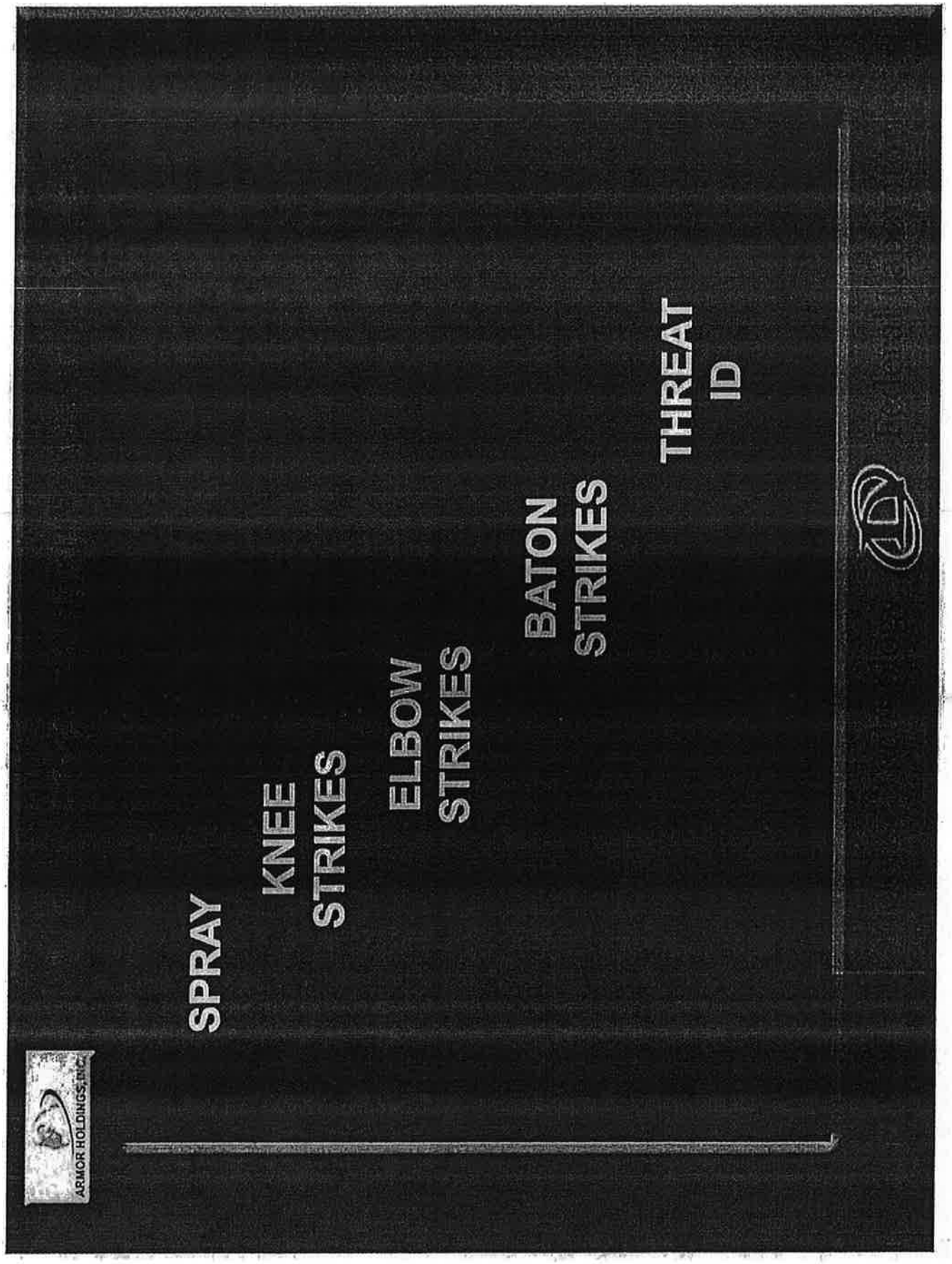
Controlled spray and contamination.
Job related drills demonstrating the officer's ability to function.
Threat identification with the ability to control the suspect.
Position of chemical distress.
Followed by a short walk to allow the respiratory system to return to normal.
Proceed to decontamination station.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SPRAY
KNEE STRIKES
ELBOW STRIKES
BATON STRIKES
THREAT ID

WHY EXPOSE?

- Mental Preparation and Safety
- Creates confidence in product
- May reduce punitive uses
- Enhances courtroom testimony

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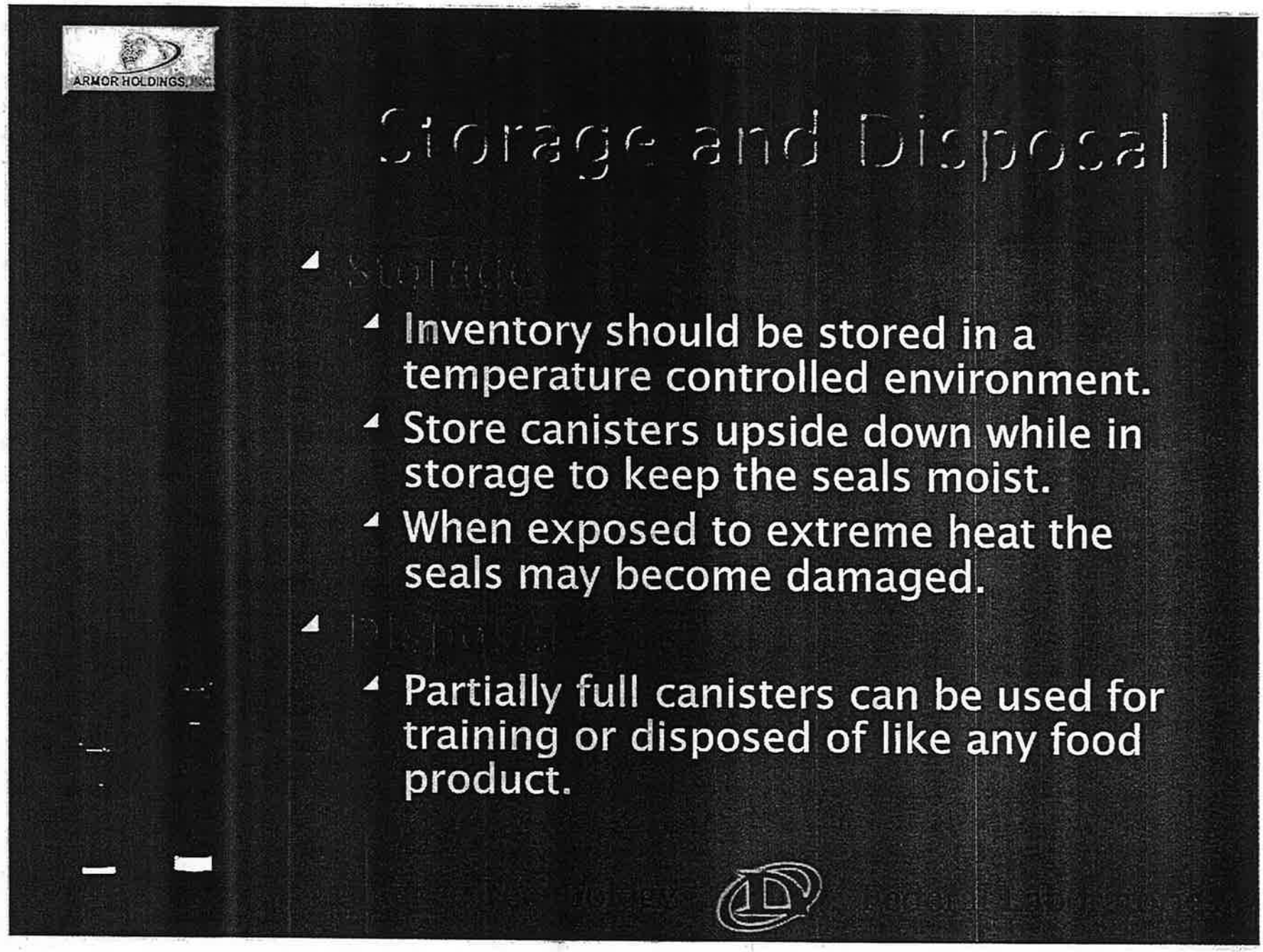

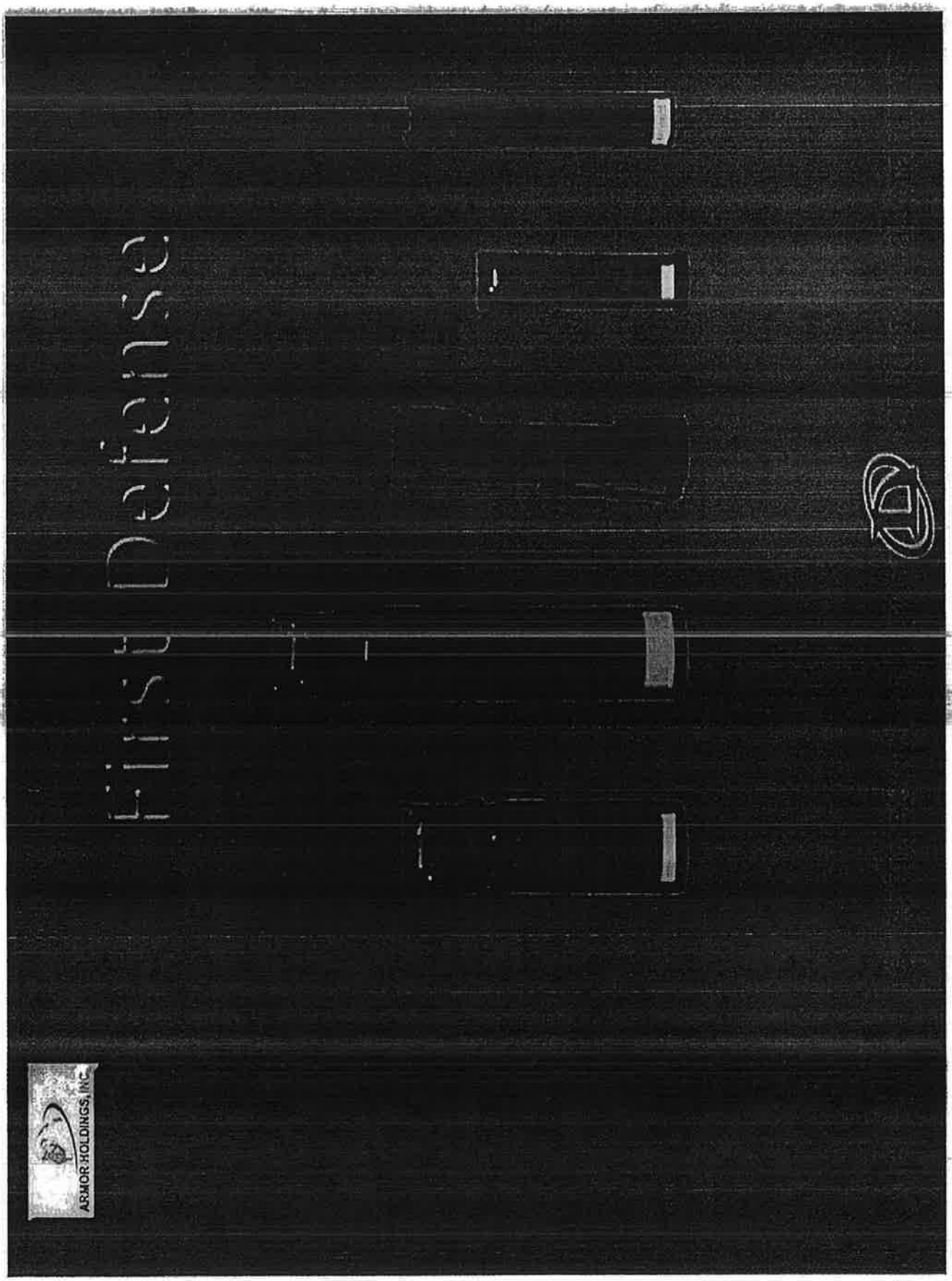
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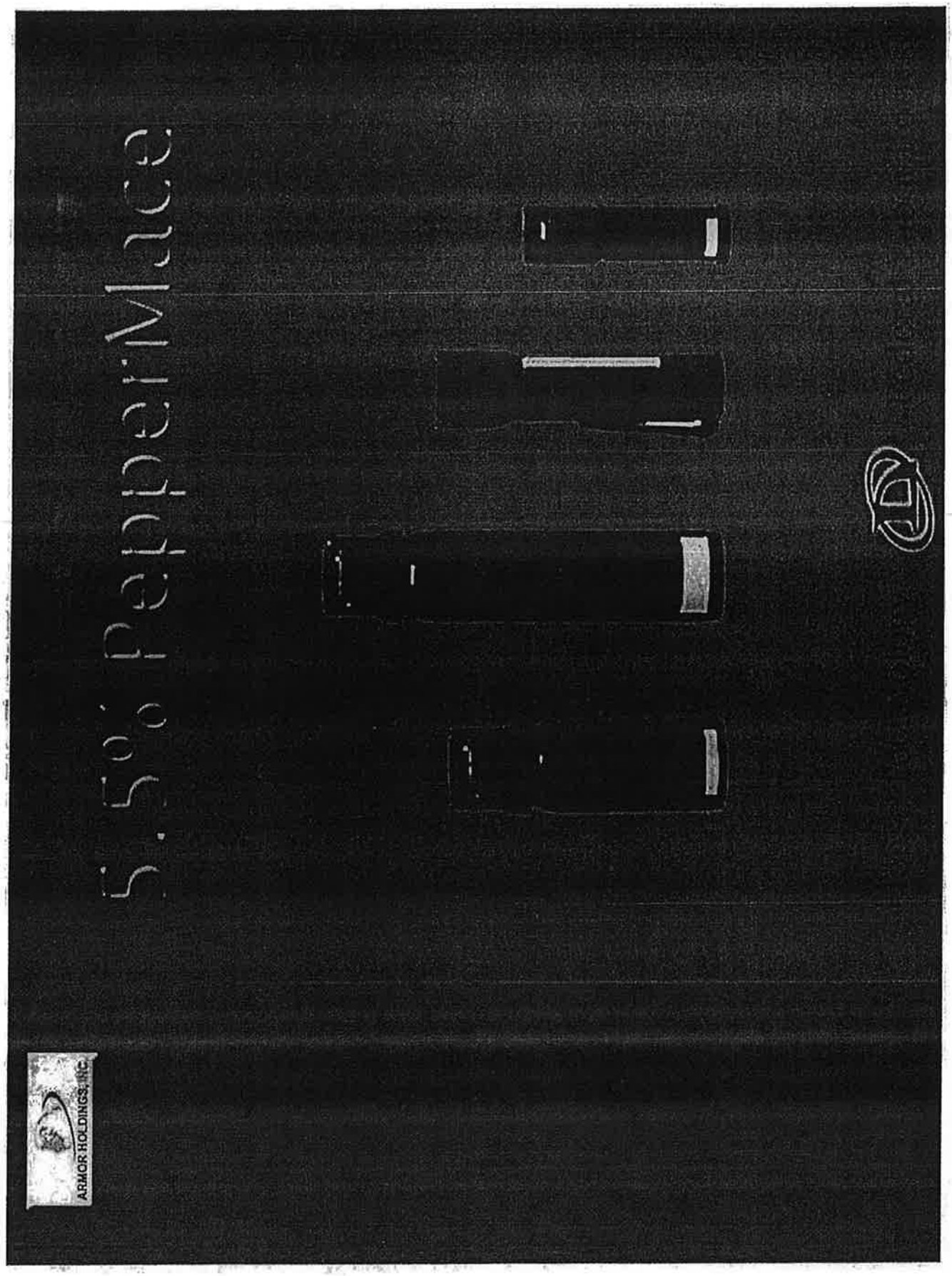
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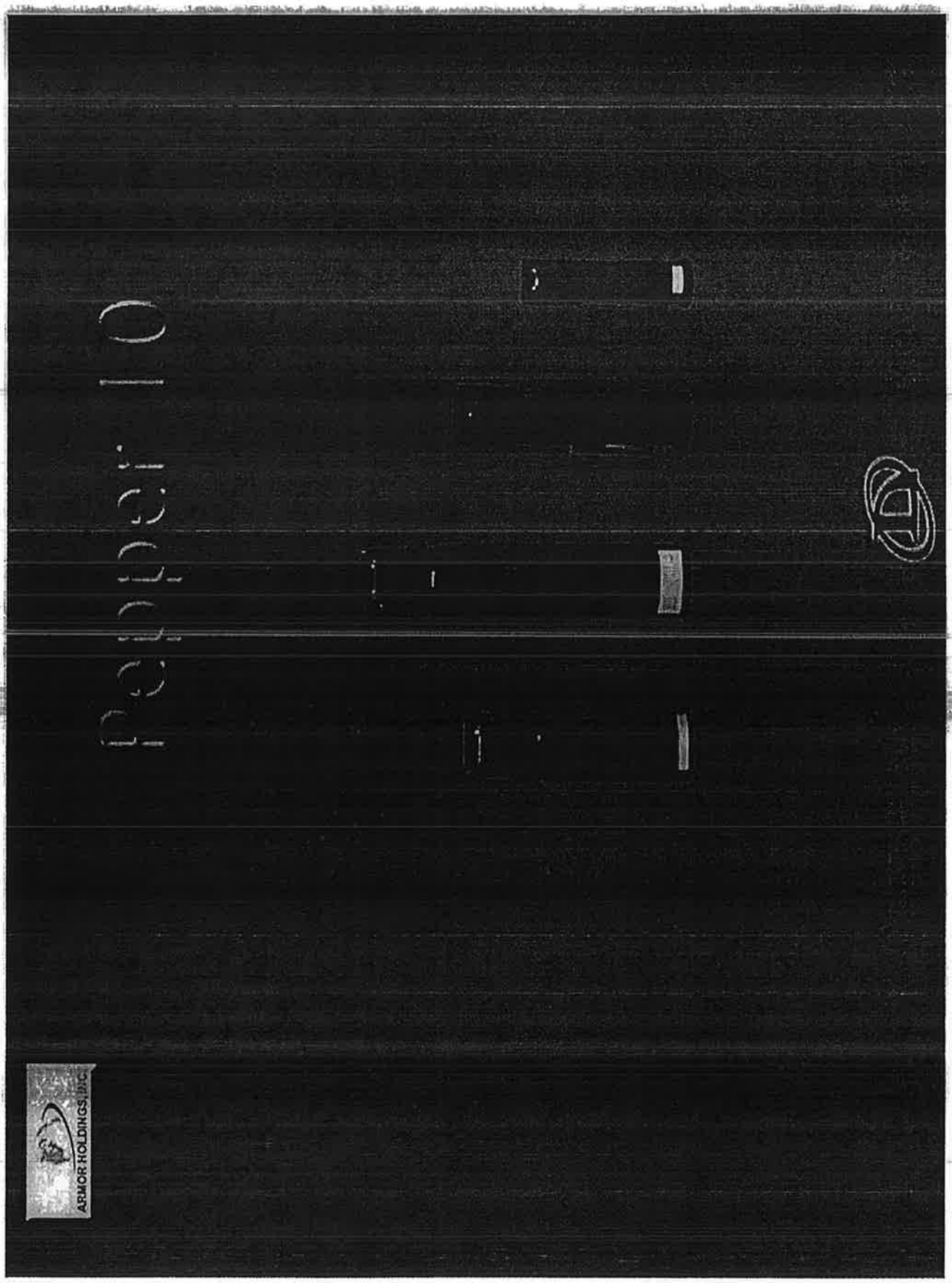
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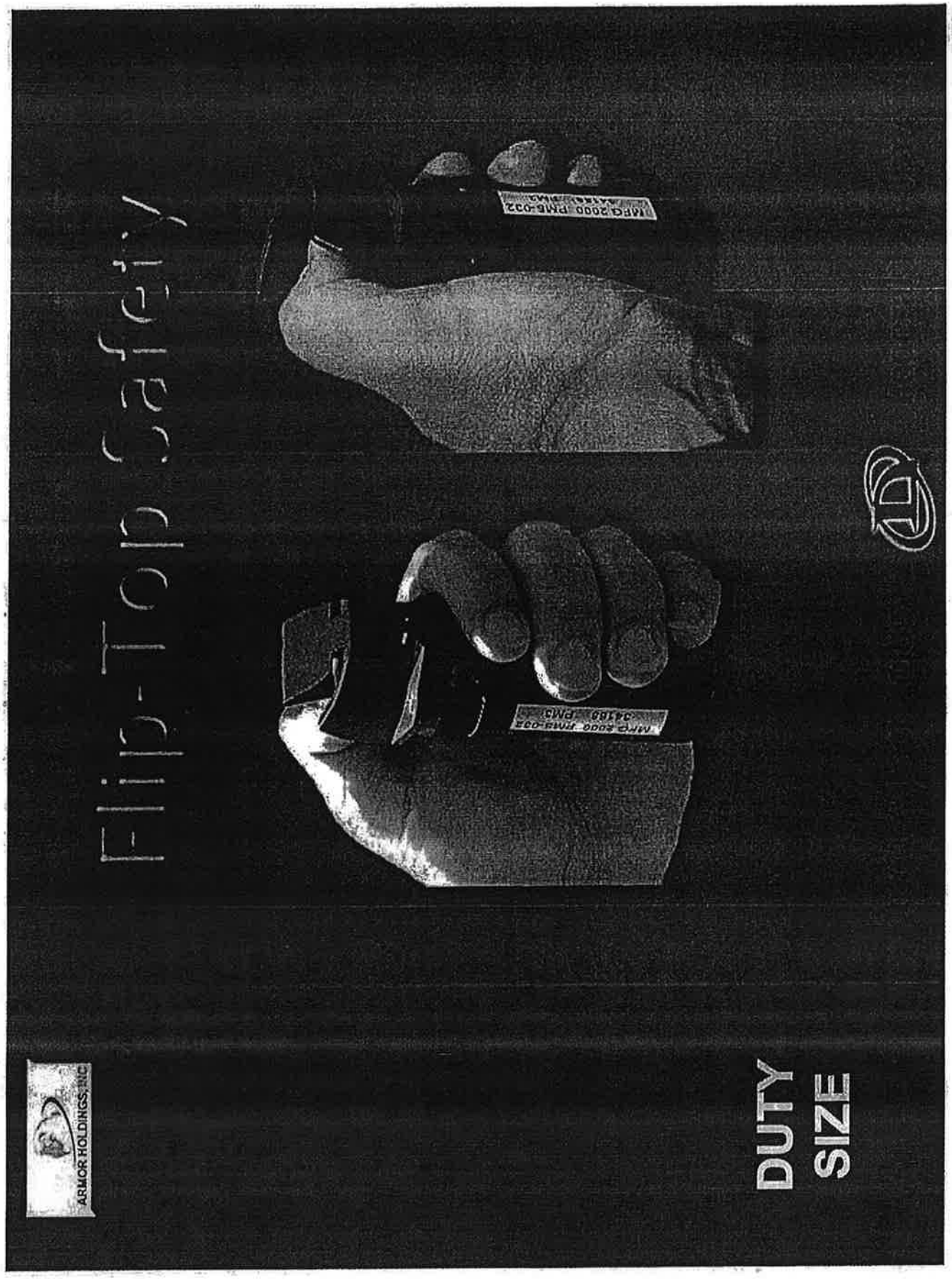
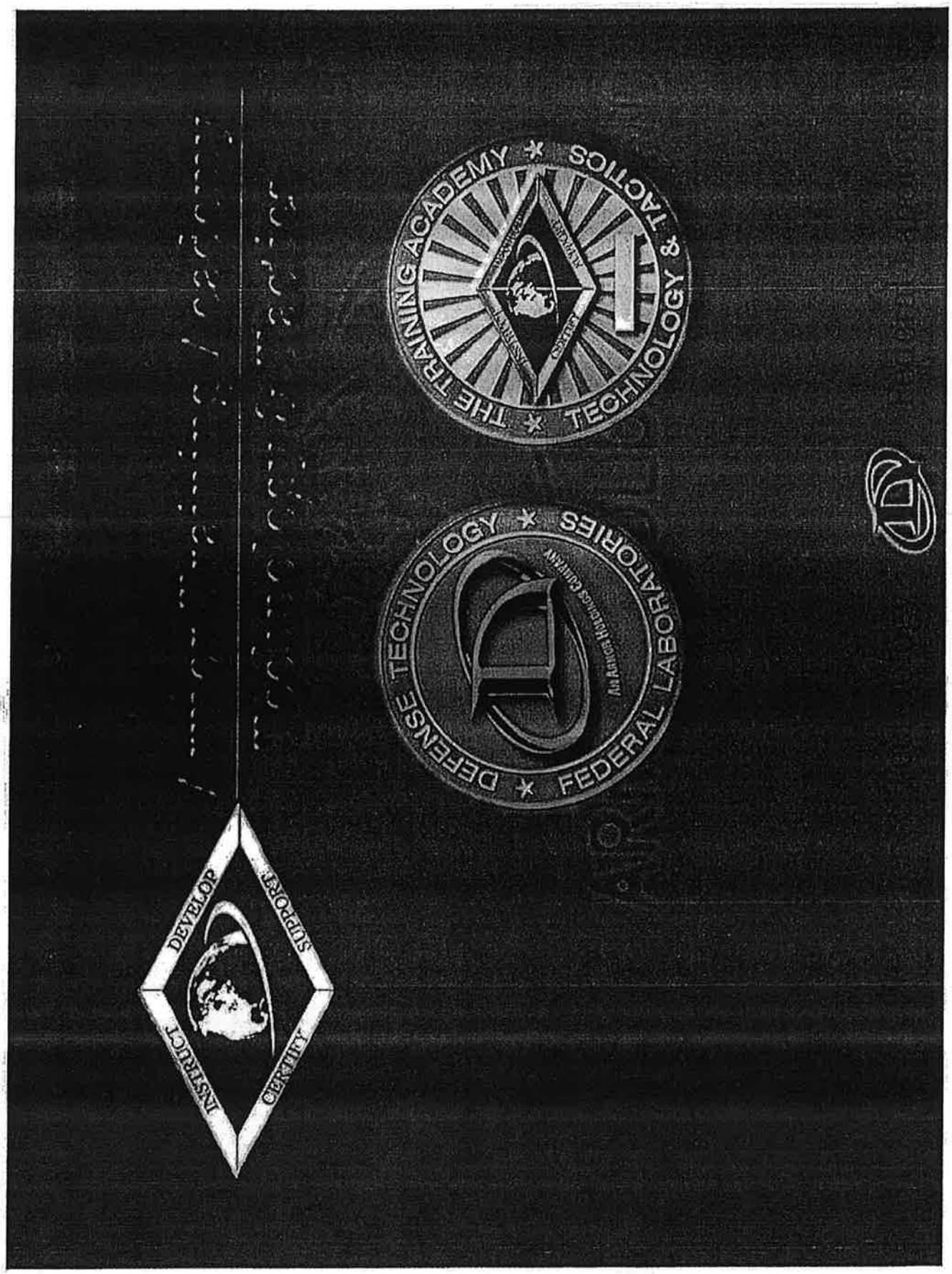
Inert
Training Units
INERT
TRAINING
UNIT
ARMOR HOLDINGS, INC.

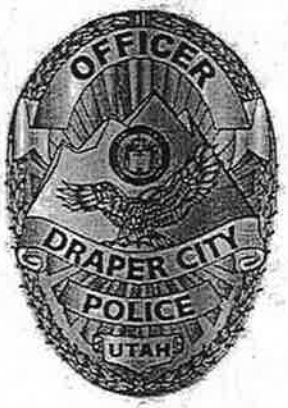
MK-4 & MK-46
RIOT BRIGADE SHIELD
ARMOR HOLDINGS, INC.


Flip-Top Safety
DUTY
SIZE
ARMOR HOLDINGS, INC

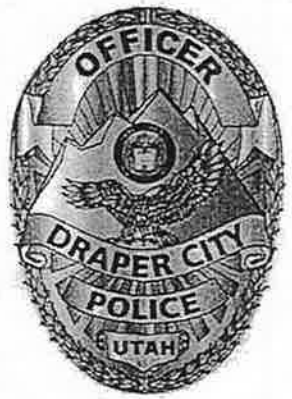
Nomenclature
Flip-Top Safety Cap
Activation Button
& Nozzle
Valve, Lid
& Stem
Seamless
Aluminum Can
FLIP TOP SAFETY
ACTUATOR / NOZZLE
VALVE ASSEMBLY
CANISTER
TUBE
ARMOR HOLDINGS


THE TRAINING ACADEMY * TACTICS & TECHNOLOGY
DEFENSE TECHNOLOGY * FEDERAL LABORATORIES
DEVELOP
SUPPORT
INSTRUCT
CERTIFY

DRAPER CITY POLICE
Patrol Rifle Training
Qualification



TJ Herbert
DRAPER CITY P.D.
12/16/2003



Goal

- To provide quality and realistic training for the OFFICER armed with a patrol rifle.

Training objectives

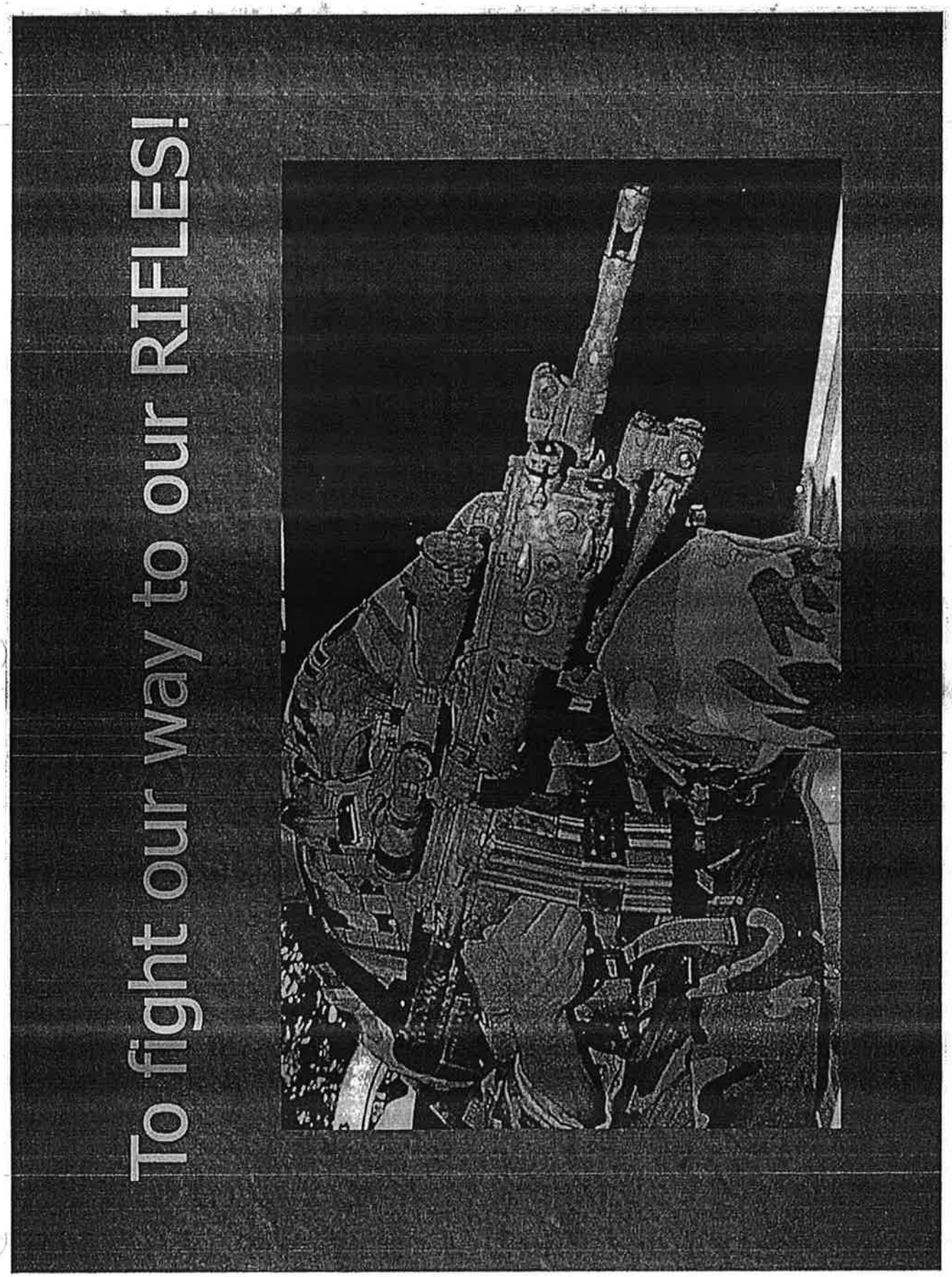
- The student will know the departments policy on the use of force.
- Student will verbalize the 4 Basic firearms safety rules.
- Student will define what is meant by "Laser rule"
- The student will state when a rifle should be employed
- The student define sight picture
- Student will verbalize the fundamentals of marksmanship
- The student will demonstrate proper sling techniques and rifle positions
- The student will demonstrate proper transition drills and tactics.

Objectives continued

- The student will demonstrate what is meant by a stable shooting platform.
- The student will demonstrate the 5 shooting stances.
- The student will demonstrate a proper magazine change.
- The student will demonstrate a correct technique for disassembly and reassembly of issued rifle.
- The student state the proper cleaning and inspection process of issued Rifle and Mag.
- On a prescribed course of fire the student will complete the course with a passing score. 80%

Purpose

Why do we carry pistols?


To fight our way to our RIFLES!